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SCIENCE FICTION AND FACT

FEBRUARY 1997

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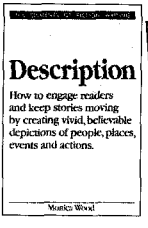
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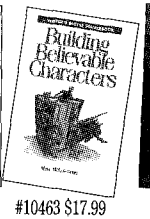

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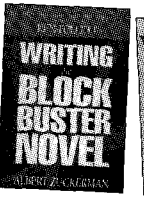

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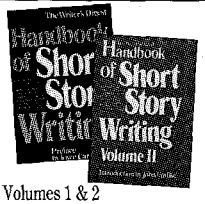

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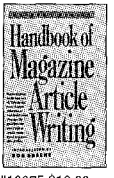

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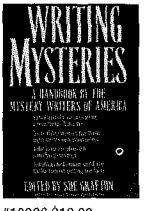

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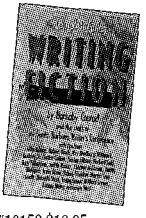

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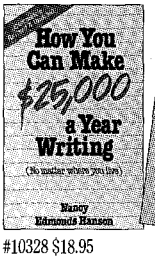

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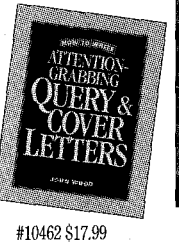

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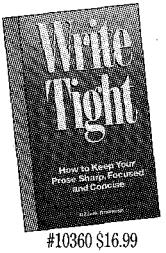

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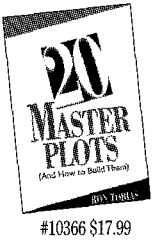

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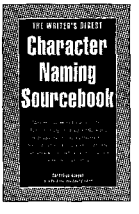

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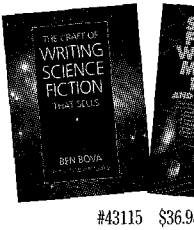

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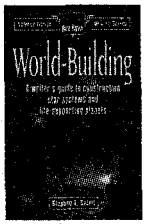

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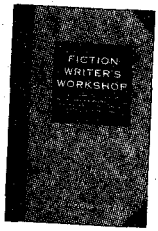

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86

Vol. CXVII No. 02
February 1996

Next Issue on Sale
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Novelettes

BROKEN SYMMETRY, Michael A. Burstein ____ 10
THE BOXIE REBELLION, Hayford Peirce ____ 52
CHASING THE IDEA RAT WITH MY BEST FRIEND, JAIME, David Phalen ____ 108

Science Fact

THE NEW ERA—PART II, Ben Bova ____ 41

Short Stories

KISS ME, Katherine MacLean ____ 82
THE PLAY'S THE THING, Timothy Zahn ____ 86
OUR SHARE OF DARKNESS, J.R. Dunn ____ 128

Reader's Departments

THE EDITOR'S PAGE ____ 4
BIOLOG (Michael A. Burstein), Jay Kay Klein ____ 40
IN TIMES TO COME ____ 103
THE ALTERNATE VIEW, G. Harry Stine ____ 104
THE REFERENCE LIBRARY, Tom Easton ____ 145
BRASS TACKS ____ 153
UPCOMING EVENTS, Anthony Lewis ____ 160

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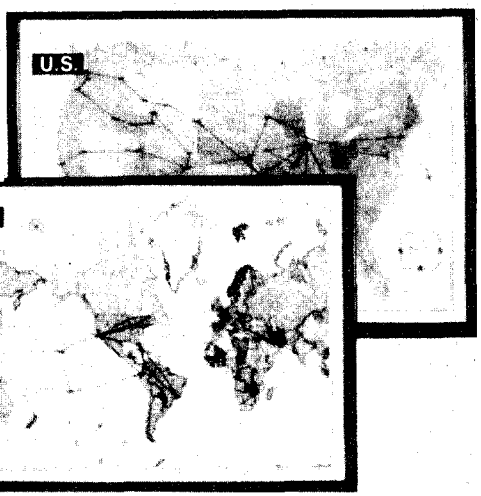

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EDITORIAL Stanley Schmidt

THE ALL OR NOTHING FALLACY

A character of mine once observed that rationality, when it exists at all, usually exists only as a transient state on the way from one extreme to another. Part of the problem, I think, is that extremes—beliefs that *everything* must be done thus, or *nothing* should be—are much *simpler* than the middle ground. If you can sincerely believe that everything is black or white, or that eating chocolate is always good or always bad, your life is (or at least seems) much simpler than if you have to try to judge just how gray things are, or how much chocolate might be how good or bad for which individual. It takes so much less *thought* that way, and thinking is *work*.

Of course, reality isn't always so obliging. It has this annoying habit of actually coming in many shades of gray (and even colors!). Metabolisms vary from individual to individual, so that a chocolate habit which brings one person a lot of pleasure and few, if any, bad side effects might be very bad, perhaps even lethal, for another. So simplistic beliefs that everything or everybody has to be treated the same way, whatever that way might be, tend to lead to inappropriate decisions and undesirable consequences.

When that happens often enough, people begin to notice and decide that the simplistic creed they've been following isn't so hot after all. So they throw it out—baby, bath water, and all—and start doing just the opposite.

Until they realize *that* doesn't always work, either. So, having had time to forget, they start moving back. . . .

So it is that much of history is the story of cultures oscillating between philosophical extremes. It is valuable to have consistently applied principles, provided they're well formulated, take into account all relevant facts, and don't get confused by facts that are *not* relevant. Unfortunately, that isn't as easy as it sounds—if only because real situations tend to be well cluttered with facts, and it's not always obvious which ones *are* relevant.

Consider, for example, the question of personal freedom (and what better time to bring this up than right before or after a major election?). In many times and places, society—through government, church, and/or custom—dictated practically every move in everybody's life. Such conditions have led, not surprisingly, to reactions in which it became fashionable to think that individual freedom is paramount and people should be free to "do their

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own thing." Both extremes, of course, have their problems, and tend to lead to reactions going back toward the other extreme. Hardly anybody ever seems to think of trying to stop at a sensible position somewhere in between.

Many educators and employers, for instance, have strictly regimented every aspect of their students' and employees' behavior at school or work, imposing, for example, strict, detailed dress codes. Others, seeing no real relevance of such details to the job at hand, have been much more laid-back about them—but sometimes an easygoing attitude about peripheral details extends to a general laxness about everything, including the work itself. People living under either "all or nothing" philosophy—strictness about everything, or strictness about nothing—tend to find enough cause for dissatisfaction to drive them toward the other extreme. A lucky few manage to stop, at least for a little while, before they get there.

Clearly, if a society is to function well, the people doing its work must be held accountable for doing it well. A general "anything goes" attitude simply won't work and can't be tolerated. It *does* matter, very much, that a pilot or a surgeon take pains to do things right, all the way down to the smallest detail. It even matters that a grocery stock boy shelve merchandise in the right part of the store. If many of them fail to do so, customers won't be able to find what they need and the store will lose them and go out of business.

But it doesn't really matter what color shoes any of them wear—pilot, surgeon, or stock boy. Many employers and educators have demonstrated that it's quite possible to demand, and get, adherence to high standards in the areas that actually matter, while remaining quite flexible about peripheral things that don't.

Of course, what things matter varies from job to job. As a writer, I *must* meet deadlines, but my publisher doesn't care what kind of weird hours I might spend at the keyboard to do it. (I've known several hundred professional writers and have yet to meet any two who work the same way.) As a musician, I must be on stage and ready to play at the scheduled time for a rehearsal or performance, every time. In one case, being in a particular place at a precisely specified time is essential; in the other, it's irrelevant. Again, it's a case of judging what's appropriate for a particular situation rather than categorically assuming that all situations

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must be treated the same way. (When I'm being a musician, even the color of my shoes can matter! The appearance of an ensemble is part of the show, and scuffed white loafers on one member of an orchestra dressed all in shiny black can definitely distract an audience.)

Judging what is actually important in each situation, so you can concentrate on that and "not sweat the little stuff," is, of course, a challenge. Some institutions and individuals—military organizations are the classic example—feel that it's so important that some of their jobs be done exactly right that they dare not risk leaving *anything* to individual judgment. Military people put up with it, because they have no choice and/or view their service as temporary and important, but many civilians won't. Thus, dictating how everything is to be done generates one set of problems, and the "obvious solution," abandoning all standards, generates another. Both are genuinely problems, and neither is genuinely a solution.

The tendency to swing between simplistic extremes tends not to affect just a few particular lines of work, but to permeate a culture's entire mindset. This country, in the 1950s, placed a great deal of emphasis on conformity: on "belonging," "fitting in," and generally doing What Was Expected in everything from raising the right kind of family, to going to church on Sunday, to wearing the right kind of socks. Enough people eventually got tired of that to produce a reaction: such an extreme emphasis on individual freedom in the '60s and '70s that some people, lacking either a strong personal philosophy or strong social guidance, drifted with no clear idea of how they should (or even wanted to) live.

Now (quite predictably) we're see-

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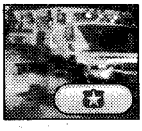
TECHNOLOGY UPDATE

Why pay for cellular phone service if you only want it for emergency use?

The SOS Phone offers a 24-hour call center to connect you with your emergency roadside service, 911 service or family members in the event of an emergency.

The SOS Phone gives you instant access to the emergency service you need, from towing to 911, even a family member or friend.



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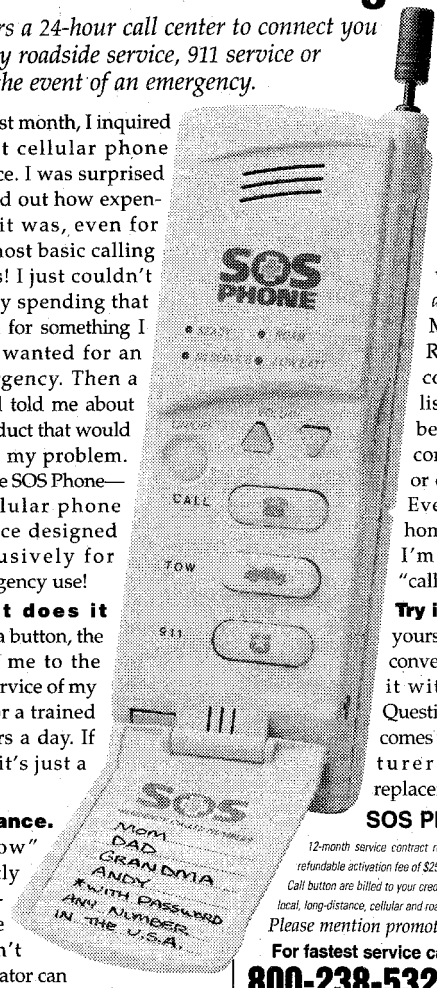

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ing a reaction to *that,* in a growing call for more standards and enforcement. Extreme examples recently in the news as I write this include a widespread clamor for school uniforms and curfews for everybody under a certain age. Imagine the outrage if somebody suggested imposing similar requirements for all members of a sex, a race, or a religion. (Remember when—and where—Jews were required to wear stars?) Treating children differently from adults is not, of course, quite the same thing; but the difference is not as absolute as all that. Nor is "childhood" a state defined with absolute sharpness and clarity. Even if you accept (as most societies do) that children *must* be treated differently in some respects, that does not automatically justify any and all differences. Nor does it eliminate the need to think carefully about where, and how sharply, the boundaries are to be drawn.

The simple fact is that such movements as "uniforms and curfews for all" can be seriously considered only because the target group doesn't have the clout to defend itself. They have the serious defect of deciding how to treat people on the basis of belonging to some demographic group—which is as much Applied Prejudice as if the target group *were* women or men or blacks or whites. It may save the trouble of learning which individuals deserve such treatment; but it punishes the innocent along with the guilty, hardly an ideal of the best periods of American history.

Let me propose a better way of thinking. Instead of saying that all people under a certain age must be off the streets before a certain hour (the confusion of equality with fairness), let's take the trouble to look closely at which ones are actually causing trouble. Then let's deal firmly and in no uncertain terms with *them*—instead of making excuses for them and letting them off with no consequences for their misdeeds. Instead of saying that *all* actions must be left to individual whim, or that all must be dictated, let's take the trouble to recognize that *some* actions cannot be tolerated, and then be consistent about not tolerating them—while not meddling with those that do no harm.

In other words, let's use our brains and some rational discrimination and gumption to make a way of life which is actually better, and let people of responsibility be treated as such—while making them *earn* that right. That will, of course, require large numbers of people to learn to think clearly enough to damp down those oscillations between "all" and "nothing." But wouldn't it be worth it? And are you *sure* it can't happen—eventually? ■

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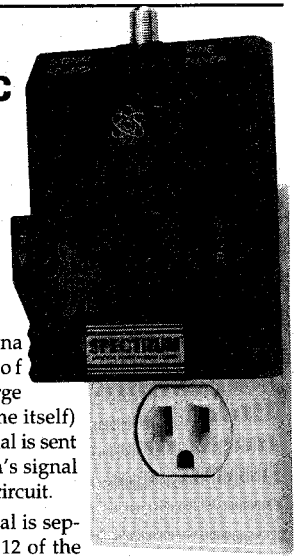

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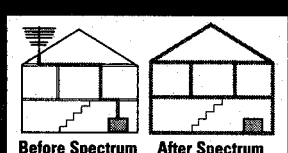

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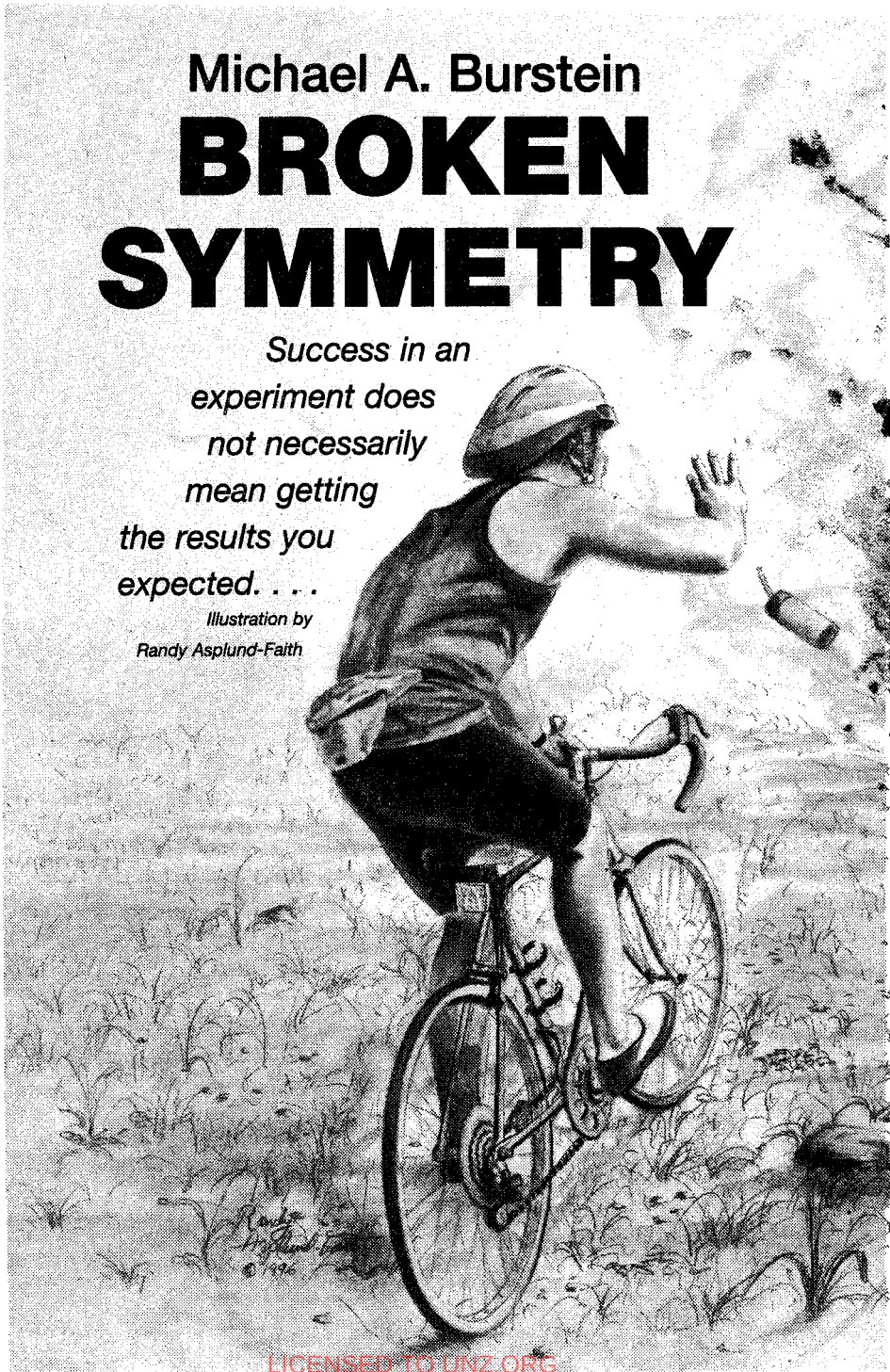
Success in an experiment does not necessarily mean getting the results you expected. . . .

Illustration by Randy Asplund-Faith



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Prologue: Spin Down

No one saw the first four explosions. Only two people witnessed the fifth explosion, and it killed one of them.

Jack Levinson and Daniel Strock, fellow math teachers at the local high school in Waxahachie, Texas, always spent their Sunday afternoons bicycling along the path of the old, abandoned Superconducting Supercollider main ring. Its sixty-mile circumference surrounded the town, a greater distance than either of the two friends ever bicycled on any given day. Instead, they liked to drive to the spot on the ring where they had last left off their biking, pedal for a few miles, and then return to their car. In bits and pieces, they had made a habit of completely finishing the path of the accelerator every few months. Not that they could see the old collider ring, of course, since, like most particle accelerators, it had been built underground. Nor did a track actually run above the buried ring. They bicycled on dry grass that looked the same everywhere, so that unless you knew the collider was beneath your feet, nothing in the way the ground appeared would tell you otherwise.

On this particular October afternoon, shortly after starting their ride, they stopped for a moment to relieve their thirst. They remained straddled on their bicycles. Jack reached down for his canteen, and poured the cool water down his parched throat. He offered it to Daniel, who shook his head. "I'm busy," he said, checking his compass against a map.

"Come on," Jack said, "you'd better take a sip if you don't want to end up dehydrated."

Daniel smiled. "Nah, I can take it."

"You say that each and every time, and last week I almost had to carry you back to the car. Here." Jack thrust the canteen at his friend, who took a sip and tossed it back.

Jack looked around. "Which way now?"

"Well," Daniel said, turning the map around and squinting into the Sun, "I think we go—this way!"

As he spoke the last two words, he jumped back onto the pedals and sped away from Jack. Jack shook his fist, and almost lost his balance getting back onto the bicycle. Daniel was already thirty feet ahead. Laughing, Jack shouted, "Damn you! You always try to turn this into a race—"

A large explosion interrupted him, a loud boom accompanied by a blinding flash of light. He hit the dirt instantly, his body remembering the air raid drills from elementary school. Duck and cover, that's what they always said to do. In a moment, the boom turned into the echo of a distant rumble, and Jack looked up.

The explosion had left a gaping hole in the ground, right where Daniel had been pedaling. Smoke drifted lazily out of the hole. Daniel and his bike lay off to the side, thrown by the force of the explosion. Jack jumped off his bike and ran over to his friend.

"Daniel!" he screamed, and what he saw shocked him. Daniel's body was bruised and bleeding all over, and covered with metal fragments. He didn't react to Jack's scream.

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Jack regained control and gently shook Daniel on the shoulder. It was scorching hot, and Jack pulled his hand away in searing pain. As he did, pieces of Daniel's shirt and flesh came with it.

Jack spat on his hand in disgust, and took another look at Daniel. His friend's head lolled off to one side, and he looked as limp as a rag doll. He was dead. Jack assimilated this information as best as he could, and passed out.

"Sheriff, Mr. Levinson has been in a major accident, and I don't want you getting him all worked up."

"Don't worry, Doc," said Sheriff Bob Kingsley in his natural drawl. He fixed his eyes in a squint and looked at the two Ellis County deputies, who nodded in agreement. The three made a strange picture, standing in the antiseptic white hospital hallway in uniform. Kingsley wore a ten-gallon hat over his dark, curly hair, the one affectation he allowed himself. "We just want to ask him a few questions."

Dr. Korn shook his head. "Only one of you. I don't want him to get too excited."

Kingsley shrugged and followed the doctor into the hospital room. He emerged a few minutes later and headed over to the nurses' station, his deputies in tow.

Waiting at the station was Sam Stratton, of the FBI. "Well?" he asked Kingsley, in a clipped voice.

"Well," echoed the sheriff. "Mr. Levinson saw another hole form."

"That makes five, now. And the first direct evidence that the ring is dangerous. It was an explosion, right?"

"Yep, and a pretty nasty one from what Levinson said. He's still shaken up over the death of his friend."

Stratton dismissed Kingsley's concern with a wave of his hand. "OK, Sheriff, thanks for your time. I'll take over the investigation from here and call in my people." He reached for the phone, but Kingsley interceded by grabbing his wrist.

"Begging your pardon, Mr. Stratton, but this is still Ellis County, and the area of the collider is still under my jurisdiction."

Stratton glared at him. "We have jurisdiction over federal land."

Kingsley smiled. "Ah, but it ain't federal land anymore, is it? Hasn't been for quite some time now."

Stratton pulled his wrist out of Kingsley's grip, and brushed it off on his pants. "Very well, Sheriff. So what do you plan to do?"

"First thing I'm going to do is set up police barricades and declare the ground above the ring off limits. It won't keep out everyone, but it should give us a few days of leeway before the press catches wind of it."

"That's exactly what I was planning to do. I don't see why I shouldn't be the one to supervise."

"They won't respect your barriers as much as they'll respect mine, Mr. Stratton. Most of these people have an idea of who I am, and trust the sheriff's office. You're just the guy they sent in from Austin."

Stratton squinted at Kingsley. "I can bring in the army, if necessary."

Kingsley frowned. "The army? You don't really want to antagonize the

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townsfolk unnecessarily, do you? People don't usually go out to the collider anyway. What's the point of attracting all that attention?"

Stratton glared at him. "I still need to call in some people. Scientists."

Kingsley shook his head and smiled. "Call in your scientists if you want, Mr. Stratton, but I'm going to call in mine. Probably just as good."

"Yours?" Stratton asked, with the slightest hint of a sneer.

"Yep, mine. I'm going to call in the guy who knows all there is to know about this accelerator. Got to know him a little over ten years ago, when he first came to direct the project. He's back at Harvard now. If anyone knows what caused this thing to start burping over the past month, he would." Kingsley turned to his deputies, and in an even voice, said, "Get me Roy Schwitters."

1. Spin Up

The Superconducting Supercollider had been up and running for over a year now, and Ray Shwartz still couldn't figure out why they weren't able to get any data. He squatted in an underground access corridor, next to the main ring, and inspected the wall separating the two. The fluorescent light and white walls made it easy to see, and what Ray found annoyed him. There was nothing wrong with the wall. It was completely whole.

Footsteps echoed from behind and interrupted him. He stood up, pulled up the knot of his tie and mopped his bald head with a handkerchief; despite the air conditioning system and its infernal hum, Ray still felt hot from the Texas climate. He was more used to the climate of Boston, or Seattle. "Yes?" he asked, turning around.

Dr. Julia Kristin Anderson came around the corner. "Hello, Professor Shwartz—I mean, Ray," she said, and smiled.

Ray smiled back at her. Kristin had her Ph.D. for a year now; they were more colleagues than teacher and student. And yet she still couldn't break her old habits of calling him "Professor."

"It's OK, Kristin. At least you didn't call me 'Director.' What's up?"

She squatted down next to the wall that Ray had just examined, and checked it herself. "Completely intact."

"I thought we might have had a resurgence of the fire ants," Ray said, "but I doubt even they could chew through that." They laughed for a moment as Kristin stood up, and then Ray continued. "So what news do you have for me? It's obviously not a problem with the ring."

Kristin's face settled into a more somber expression. "I wanted to tell you this personally." She paused.

"Yes?"

"Apparently, there's nothing wrong with either the scintillators or the computers. The particle detectors should be working perfectly."

Ray closed his eyes and sighed. "Damn. That's what I was afraid of. How many beams have we run since the collider became operational? Almost a hundred, right?"

"Ninety-three, if we include the beams at the beginning that *did* yield data."

"It wasn't enough." Ray pulled a

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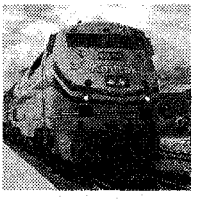

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sheet of paper out of his pocket. "Damn it, Kristin, I wish I could figure this out. The SSC was my major goal in life. I know this may sound silly, but it was to be the grand culmination of the years I had spent doing physics. By now, we were supposed to have found the Higgs boson and verified the theory of Grand Unification. Instead, we're getting nothing."

He passed the sheet over to her. "I mean, look at that. Everything points to the collider running smoothly." He ticked points off on his fingers. "We're having no problem generating proton beams and antiproton beams in the containment rings; you and I have just ascertained that the ring walls are unharmed; and now you're telling me that the detectors are fully functional as well."

She studied the sheet and nodded. "True."

"Well, then, Dr. Anderson, tell me, *what* piece of equipment is malfunctioning? Because I certainly can't figure it out!"

She glanced around the room. "I don't think anything is malfunctioning at all."

"Nothing at all."

"That's right."

"Then why aren't we getting any data?"

"Professor—Ray, are you willing to entertain a—well, listen to a hunch?"

"I'll accept anything at this point."

She smiled. "I hope you're telling the truth, because what I'm about to suggest sounds totally ludicrous. You ever read any Sherlock Holmes?"

Ray nodded. "A long time ago."

"My husband just turned me onto the stories, and they're fascinating. Anyway, in one of the Sherlock Holmes stories, he says, 'When you have eliminated the impossible, whatever remains, however improbable, must be the truth.'"

"Yes, I remember that quote. Someone had it hanging in his office back at Harvard."

Kristin shifted uncomfortably. "Well, I was reading that story and had our problem in the back of my mind when something clicked. Assuming all our equipment *is* functioning properly, what do our results tell us?"

"They tell us that Congress will cut our funding next year."

"Seriously."

"Sorry." He sighed. "Although I am serious. If we don't show positive results, Congress will take its 10 billion dollar loss and leave Waxahachie with a big hole in the ground."

"I know. I remember the budget fights of the nineties; I almost had to leave graduate school because of it. But that's not my point."

"OK. You want to know what it means if all our equipment is functioning properly."

"Yes."

"Fine." Ray stood up and walked over to the wall opposite the one the corridor shared with the ring. An old map of the SSC hung there, at eye level, with a red X next to the words, "YOU ARE HERE." The overall picture looked like two small circles on top of a larger circle, reminiscent of Mickey Mouse's head.

"Here," Ray said, pointing to the two small circles, "we're generating

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protons and antiprotons."

"Right."

"Then we inject them into the main collider." Ray pointed to the larger circle.

"Right."

Finally, Ray pointed to a rectangle that bordered the circle on the bottom. "And here, the detector should see a shower of subatomic particles when the two beams collide. But we don't get that, except for those first few runs."

"No, we don't."

"And you claim that the equipment isn't at fault. So what do you think is happening?"

Kristin glanced around the room again, like she wanted to avoid eye contact. "Ray, I think the beams are just disappearing somehow."

"Disappearing," he echoed.

"That's right. It would explain why the equipment checks out, and why we're not seeing any collisions. Before the beams have a chance to collide in the detector, they—they go away."

"You're joking, right?" he asked, staring straight at her and frowning.

She glanced away, and quietly said, "No. I'm not."

Ray sat down again. "Kristin, the only reason I'm not laughing in your face is because I respect your work too much to dismiss your ideas immediately. But you have to admit that this is a ridiculous thing to suggest."

"I know. I already said that."

"True, you did." He smiled. "And, in point of fact, your idea *does* seem to fit the data. Perhaps we ought to investigate it, just so we can eliminate it as absurd. It's not as if we've got anything else to work on here."

Kristin stood up to leave. "Thanks, Ray. With your permission, I'll go have people start moving detectors around the ring. Maybe we'll be able to localize exactly where those beams are when they vanish."

"Fine, I'll authorize it. Just one thing before you go."

She stopped. "Yes?"

"If those beams are disappearing, where are they going?"

She shook her head. "Your guess is as good as mine."

2. Spin Down

Roy Schwitters looked out over the site of the latest explosion. With his handkerchief, he mopped his bald head and rubbed the perspiration out of his beard. The hot Sun beat down on him and Sheriff Kingsley, making Roy wish he could return to his air-conditioned office at Harvard. The flat grassland, which stretched all around for many miles, had been torn up in this one spot. Dirt and metal fragments mixed together, scattered about in a nearly perfect circle, twenty meters in diameter.

Roy studied the area for a few minutes. He walked around the circumference of the debris, occasionally squatting down to pick up a piece of metal or a handful of sand. When he finished, he brushed off his pants, positioned himself so the Sun shone behind him, and turned towards Kingsley.

"You're right," he said. He spoke, as always, in a soft unaccented tenor monotone. "It does look like there was an explosion inside the old SSC tunnel."

"That's what we figured when we

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found the first four holes, but we weren't quite sure," said Sheriff Kingsley. "Jack Levinson's story confirmed it."

"I see only one problem," Roy said. "There's nothing we did that would cause explosions to emanate from the tunnel. We never even had a chance to run one beam." He gazed wistfully around him.

"We know," said Kingsley, "but this was the fifth explosion, and they've all only happened around the ring where you scientists were going to do your experiments. That's why I called you, Dr. Schwitters; frankly, I was a little surprised that you were willing to come back, after all that happened. But I am grateful."

Roy winced at the memories triggered by the sheriff's comments, but he let them pass. "Yes, I'm willing to come back, anytime. I've already told you that it can't be the Supercollider doing this; we never even had a chance to turn the accelerator on."

He walked around the debris again, and said, "Perhaps someone is setting off bombs, but I can't think of any rationale for blowing up the tunnel. The project's been long dead for these past ten years; it's not like anyone should want to sabotage it now. You've probably just got some nut whose hobbies include blowing up outmoded scientific equipment. Maybe another Unabomber. I can't help you there."

"Begging your pardon," Kingsley said, "but aren't you forgetting something? Forensics tells us that they can't find any remnants of a bomb. No chemicals, no timer, nothing. And the explosions are definitely originating from inside the tunnel."

"So?"

"Well, I don't pretend to be a physicist or anything like that, but I grew up here in Waxahachie and I remember all the hoopla when we got the SSC. I wasn't always happy about it, but I stayed interested, and kept reading up about it, even after they decided not to use the facility for anything else, like they were saying they would. One thing I remember very well was that they sealed off the tunnel after Congress killed it. So how does this mad bomber set up his bombs?"

Roy thought a moment. "He probably found a hole somewhere and crawled in."

"You mean he goes inside? We did a thorough drive around the main ring after the first explosion. Besides the holes that were actually caused by explosions—all of which we resealed immediately—*there aren't any other openings*. So even if he's as hardy as I am, Dr. Schwitters, I ask you again—how does he get inside?"

Roy had absolutely no idea what to say. He regarded the sheriff for a moment, then, without saying a word, he walked back to the car.

3. Spin Up

Kristin ran through the calculations for a fifth time. It couldn't be right, she kept telling herself. There was no way that this could be right. And yet. . . .

She rubbed her bleary eyes and picked up the phone to call Ray. He answered curtly. "Hello?"

"Ray, it's Kristin. I think—"

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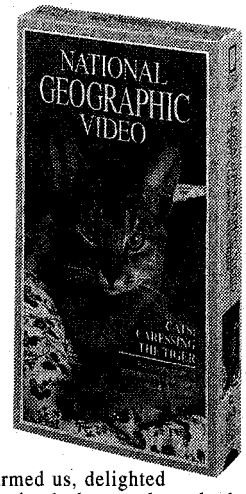

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He interrupted her. "Kristin, I don't have time at the moment. Why don't you—"

Ray cut himself off, and Kristin heard voices in the background. A moment later he got back on the line. "On second thought, why don't you come to my office?" *Click.*

That was abrupt of him, Kristin thought. Something big must be going down.

She cradled the receiver, and nervously ambled over to Ray's office. Her footsteps echoed as she walked down the empty corridor and around the corner. She opened the door.

Inside, Ray was talking with a dark-haired man in a two-piece suit. Kristin's entrance had interrupted what looked like a heated conversation; Ray's cheeks were flushed and the man looked distinctly uncomfortable.

"Kristin," Ray said, "I'd like you to meet Louis Reichen, of the Department of Energy."

Kristin closed the door behind her and approached Reichen. He was a small man, about the same height as Kristin, with a tiny mustache that looked like a chocolate stain, even up close. Kristin sensed trouble. Most people from the DOE showed up in plaid shirts and jeans, scientists interested in getting down to work on some project. This fellow looked like a businessman. He shook her hand firmly, then turned back to Ray, who sat behind his desk.

"As I was saying, Dr. Shwartz, the people back in Washington are getting restless, and they've sent me to look into things here."

Ray looked at Kristin. "Dr. Anderson, would you please tell Mr. Reichen the current status of the SSC?"

Caught off guard, Kristin mumbled, "Uh, yeah," and then filled Reichen in on their problems in getting data. "But I think I've—"

"Thank you, Doctor," Ray interrupted. "Now, Mr. Reichen. I know this seems bad, but we've only been running it for about a year now. There's bound to be problems until the accelerator has gone through a shakedown phase."

"'Shakedown phase,'" Reichen echoed. "You've had ten years to build this thing, Dr. Shwartz. Any problems you might have had during a 'shakedown phase' must surely have been foreseen."

"Not necessarily," Ray said. "When you're dealing with an experiment as large as this, there are bound to be certain unknown factors—until you actually run the experiment, that is—that can't be predicted beforehand."

"In fact," Kristin said, "that's exactly how some of the greatest discoveries in science got made. X-rays. Vulcanized rubber. The—"

"Yes," interrupted Reichen, "but none of those things cost as much as this contraption. Dr. Shwartz, do you know what they're calling this—this fiasco in Congress? 'The 10 Billion Dollar Hole in the Ground' is the least of it. I wouldn't want to tell you what I've heard them call it in back room discussions."

Reichen picked up his briefcase. "Don't get me wrong. I'm DOE; I support the collider, and want to see it

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working. But my hands are tied. If you can't show me positive results, and demonstrate to Congress that this thing is more than just a big failure—well, I'll have to tell them so, and they'll kill it."

Ray looked at the top of his desk. "What if I could show you those 'positive results' you want?"

"Well. . . ."

"Look." Ray consulted a small calendar at the top of his desk, then glared at Kristin. He said, "It just so happens that we have a run scheduled for tomorrow. Why don't you come watch, and you can judge for yourself. I promise you that we'll get 'positive results,' as you put it."

Reichen nodded slowly. "That would be acceptable. I'll leave the number of my hotel with the project secretary. I just hope you do have something to show me."

They watched Reichen leave the room, and as soon as the door closed behind him Kristin glared back at Ray. "There is no run scheduled for tomorrow."

"There is now."

Kristin sat down. "How are you going to ensure positive results?"

"I'll go out to the collider and tell it that Congress has ordered it to work smoothly tomorrow." They laughed. Ray continued, "Hey, it worked for the space program once. One model of rocket kept failing on the launchpad until someone from Washington told the chief engineer that it simply had to work the next time they launched it. The engineer went out to the rocket and ordered it to work. And it did." Ray leaned back in his chair and closed his eyes for a moment. "You had something you wanted to talk to me about?" he finally asked.

"Oh! As a matter of fact, I do." She smiled. "And come to think of it, I do need another run of the accelerator to test my idea."

"Which is?" Ray prompted.

"Ah, yes. My idea. Ray, I know what I'm about to propose will sound even more far-fetched than the idea of the beams just disappearing, but I think I know where they're going. And, more than that, I think I can predict when they'll vanish." She looked around for a moment, flustered. "I left my calculations in my office."

"We'll get them later. What's the idea?"

Kristin took a deep breath and let it out slowly. "Do you recall Hugh Everett's many-worlds interpretation of quantum mechanics?"

Ray looked surprised. "Yes, I do. Whenever a decision has to be made, the Universe splits into two separate universes. Avoids the thorny problem of the observer's role, even if it's not as elegant. Although I tend to feel that Everett's interpretation was rendered moot by John Cramer and Shu-Yuan Chu, in their transactional interpretation."

"Moot doesn't mean invalid. Everett's interpretation could still be considered a valid one."

"Oh, sure," Ray said, smiling, "assuming you could prove it over all others. People have been trying to assert one view of quantum mechanics over all others since the Copenhagen interpretation. But that's the one peo-

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ple seem to accept the most."

"Yeah. Well. The thing is, I've always been uncomfortable with that one. I mean, it's one thing to say that, for a subatomic particle we can't see with the naked eye anyway, its spin is undetermined until an observer looks at it and it chooses to be either spin up or spin down."

Ray nodded. "Wave-function collapse."

"Yes. But it's quite another thing on a macroscopic scale. Look at Schrödinger's cat. Does it really make sense to say that cat isn't alive or dead until you open the box? I think Everett's interpretation works a lot better. Schrödinger's cat ends up alive in one universe and dead in another."

"So what does Hugh Everett's thesis have to do with the SSC?"

Kristin laughed. "Sounds like a riddle. Well, it's like this. I've always been into studying the different interpretations of quantum mechanics, ever since that first course I took with Doug Strauss. And I must admit that I've always been fond of Everett's idea—can't you imagine what it would be like if every possible universe that ever could have been was really out there, somewhere?" She waved her hands in the air as if to demonstrate.

Ray shook his head. "I've tried to stay firmly planted in *this* Universe."

"Your loss. Anyway, it always bothered me that Everett's interpretation allowed for parallel universes, but ones that were inaccessible from ours. I mean, what's the point of saying an alternate universe exists if you can't get to it? It might as well not exist."

"My point exactly."

"Then something occurred to me. I read Everett's original Princeton thesis, and noticed that he failed to take into account high energy interactions. I mean, *extremely* high energy interactions, on the order of a TeV." She paused.

"Kristin, I'm not sure I see where this is leading. That is, I think I do, but—what exactly are you getting at?"

"I'm getting at the fact that at high energies, Everett's theory predicts that a quantum mechanical 'gate' opens up, similar to an Einstein-Rosen bridge. For a split second, the barrier between different universes might be traversed. But we've never been able to create interactions of that magnitude until—"

"Until we built the SSC," Ray finished for her.

"Yes."

"Kristin, that's utterly impossible."

She felt her face flush. "So was splitting the atom," she retorted.

Ray laughed. "So it was."

"And look where it led us to today. Listen, Ray. You said that we have to do a run of the accelerator tomorrow anyway, to satisfy Reichen. Let me calibrate the detectors to verify my theory. In the meantime, you can go over my math and see if I missed anything."

4. Spin Down

"I've gone over your math, and can't find anything wrong with it," Roy Schwitters said. "As much as it galls me to admit it, you're right."

Harold Volin grinned sheepishly, the grin of a small boy caught with his

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hands in the cookie jar. Six weeks ago, Roy had called him in to help figure out the problem of the SSC explosions. Now, they sat in a first floor office of the old SSC Administration building, studying the equations Volin had written out on a chalkboard. The building, along with many others, had been taken over by the county when the Department of Energy had pulled out, as there was no sense in letting good office buildings and state-of-the-art computer equipment go to waste. Sheriff Kingsley had somehow managed to arrange this office for Roy, nowhere near as luxurious as the office he had occupied when he had been director, but "good enough for government work," as the sheriff had told him.

Roy considered Harold for a moment before continuing. Harold was a theoretician, a good physicist, but had a quirky personality that made him look for solutions to problems from the strangest angles. His red hair, thick beard, and incongruously high voice fit his personality perfectly. But it was exactly because of Harold's odd way of looking at the world that Ray had called him in. And now, here was Harold's solution, too off-the-wall to be considered seriously, but the only one that fit the data. So far.

Roy spoke slowly, unsure of his words. "Your calculations do seem to indicate that someone's running the collider."

Harold nodded eagerly, still smiling. He tended to speak quickly, with one word running into another. "The first clue you gave me was the symmetric nature of the explosions. It was exactly what you'd get if an antimatter beam went off course—zing!—and hit the walls of the ring. And given that the magnets only work at a few degrees Kelvin, any beam sent through at the moment would naturally run off course. After all, the magnets aren't operational at the moment."

Roy gave his friend an incredulous look. "You're missing the point, Harold. *None* of it is operational. Not the magnets, not the detectors—and most of all, not the injectors! The SSC was never turned on. The project was killed long before we even got to the stage where we could generate *one* proton-antiproton beam, let alone five! I admit that your calculations indicate that the SSC has been turned on, but how? If there are in fact antiprotons in the ring, where are they coming from?"

Harold eyes twinkled. "That is the big question, isn't it? Not, 'Who's running the collider?' but 'Where are the beams coming from?'"

"I don't understand."

Harold's voice took on a sober tone. "Look, Roy, I know as well as you do that the SSC isn't operational. There is no way that those beams are being generated by our SSC. But maybe—just maybe—they're being generated by some other SSC."

"Some other SSC?"

"In another universe."

It took all night, but Harold finally convinced Roy of the logic of his theory. It had been difficult, at first, as Roy was a strong supporter of the standard Copenhagen interpretation

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of quantum mechanics.

But the equations were incontrovertible.

"At least it gets rid of all those bizarre paradoxes," Roy said.

Harold blinked. "Understated, as usual."

"What do you mean?"

"You don't seem to appreciate the magnitude of what I've proven here, Roy. Ever since the theory of quantum mechanics was developed, no one has been able to settle on one interpretation."

"That's because all were equally valid. Everything we observed fit any interpretation, from wave-function collapse to Bohm's hidden variables."

"But not anymore! Don't you see? This discovery is so important, it'll shake the foundations of philosophy as well as physics."

Roy harrumphed and shook his head. "And it's all due to a killed experiment. Don't get me wrong, Harold, I am happy for you—"

"For us, you mean. It would be indecent not to list you as co-author."

"All right, for us, then. But it still doesn't change one annoying, undeniable fact. I was hoping that what we found would indicate a working collider."

"Well, it does, in a sense," Harold said. "It indicates a working SSC in some other universe. If it hadn't been killed, it's now about the time when we would have started running the machine. Think of it."

Think of it. A universe where the SSC was never canceled. A universe where science never lost its way, where the government and the lay people understood the importance of this project, appreciated the need for basic research.

Perhaps in that universe, the other projects, like SETI and the human genome project, were also going strong. Perhaps in that universe, the space program hadn't stopped at the Moon, but was even now moving humanity towards the stars. Perhaps. . . .

"Harold," Roy said softly, "can we use your theory to travel to that other universe?"

Harold looked wistful, and shook his head. "I'm afraid that's unlikely. The energies are just too much. You'd have to be in the path of the beam, and that would probably kill you. Of course, we could get a resonance effect going, but I'm not sure how."

Roy bit his lower lip and nodded. "It was worth asking. Too bad we can't use your theory to our advantage."

The two men sat in silence for a moment, and then Harold's eyes glinted. "Actually, we can!"

"How?"

"Look," Harold said, "What's the most expensive part of the SSC?"

"The ring, of course," Roy replied.

Harold nodded, excitement in his eyes. "Yes, the ring. The detectors and even the computers are cheap compared to that. But don't you see? We don't have to worry about funding the ring anymore!"

"You mean to say—" Roy began.

"I mean to say that someone else in another universe is paying to run the beams. We can just set up detectors and piggyback on their experiments, like when we do experiments on syn-

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chrotron radiation. We just have to wait for a crossover, and I believe I can calculate when those will occur. And when a beam comes through—zing!—and collides with the protons in the surrounding dirt, we take data."

Roy pressed his fingers together and leaned back in his chair. "We could restart the SSC at a fraction of the original cost," he said, "because the scientists in the other universe have already built it."

"My point exactly."

Roy picked up the phone to call the Department of Energy.

5. Spin Up

The Reichen run, as Kristin called it, was six weeks in the past. It was also the only run of the collider that had actually gone perfectly, ever since Reichen threatened to shut them down. Perhaps, Kristin had told Ray jokingly, there had been something to the idea of ordering the collider to behave itself. Since then, they had run the accelerator many more times, and as always, the beams kept disappearing.

Kristin and Ray stood on the hot grassy plain, studying the detector that should have picked up the beam they had run earlier today. After half an hour of examining the huge boxes filled with plastic scintillator, she turned to Ray and said, "Now do you believe my theory?"

Slowly, Ray said, "It does seem to be the only possible answer."

"*Only* answer, you mean. Ray, you've checked my calculations. You know that I've predicted every single beam disappearance since the Reichen run. Either I'm the victim of the most improbable set of coincidences, or—" She shrugged. "Or I'm right. And I must be. The data proves it."

Ray nodded. "I guess you're right. Too bad."

"Too bad?" Kristin felt stunned. "What do you mean, too bad? We've just demonstrated something that will shake the theoretical foundations of physics as much as relativity did!"

Ray smiled, bitterly. "Come on, let's walk back to the car."

In the car driving back to Waxahachie, he continued. "Kristin, I didn't mean to belittle your accomplishment. Your theory will make a major impact, and you should be proud of that. But your theory also means that we're going to have stop running the collider immediately."

"What? Why?"

"Because if the beams are being diverted into another universe, who knows what damage they're doing there? We're sending antimatter beams into the unknown. If they're interacting with the matter of an alternate Earth. . . ." He trailed off.

Kristin swallowed hard. "I see what you're saying, but I don't think we have to worry too much about that."

"Why not? You don't care if we're causing matter-antimatter explosions in another universe?"

"No! It's not that at all. We don't have to worry about the explosions hurting anyone, because for this phenomenon to be happening, our SSC would probably have to resonate with another SSC in the other universe. It's inherent in my calculations."

Ray nodded. "I see. If that's the

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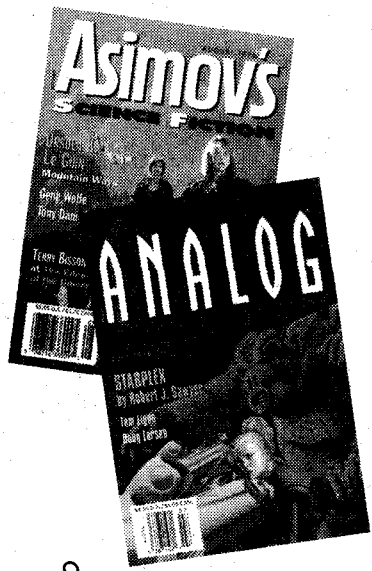

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case, then our beams would be traversing the barrier between universes simply to go from our tunnel into theirs."

"Exactly. The beams may be going into another universe, but only if there's an SSC ring there." She paused. "An abandoned one, actually."

"Abandoned? How do you know that?"

"Because otherwise the energies of their beam would cause positive feedback with ours, and—and I don't want to think about what that would do to our universes. It might bring them together, or blow them apart."

Ray sighed. "An abandoned ring. How ironic."

"Ironic?"

He was silent as they took a curve. "Louis Reichen called today, from Washington."

"Oh. It's not good news, is it." It was a statement, not a question.

"No, it's not."

"That's why you brought up the idea of shutting down the SSC back there. To soften the blow."

"Yes. After all, if we're going to have to shut it down anyway, I would rather there be a good reason behind it. And if it was harming people in another universe, that would be a good reason. But this—this is just stalled budget talks and political infighting. And we're the ones getting the ax for it."

Kristin didn't want to ask the next question, but needed to know. "How soon?"

"They're giving us half a year to wrap up any experiments that we might still be running. I got them to grant us that much."

"And then?"

"Unless we can think of some way to get those beams back, that will be the end of the SSC."

They rode the rest of the way back in silence.

6. Spin Down

Roy couldn't believe his luck. In only four weeks, they had convinced the DOE to reopen the SSC facility. He and Harold stood on the ground above the underground ring, watching the last of the scintillator detectors from Fermilab being installed.

"Are you sure about this, Harold?"

His eyes twinkled. "Very sure, as always. According to my calculations, this is the third most probable spot for the crossovers to occur. And anyway, the evidence is already all around us." He swept his arm around to indicate the various holes in the ground, formed by fresh explosions during the last month. The current detector was being set up on a piece of the ground that was, as yet, unscarred.

"True," Roy said, "although—"

A far away boom interrupted Roy. Everyone jumped, including the people setting up the new detector. They continued working when the echoes died down.

"Harold?"

"Sounds like it came from Detector One. A little early, but let's go check it out."

The two men drove along the circumference of the ring until they found the fresh hole, smoke lazily drifting out of it. They parked a safe distance away and approached on foot.

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"Look," Harold said, and whistled.

The hole was right in the center of the surrounding detector, which was unharmed. A blue light indicated that the detector had successfully taken data, which at this very moment the computers back in Waxahachie would be analyzing.

"I can't believe our luck," Roy said.

Over the next few months, Roy, Harold, and other physicists gathered in Waxahachie, and pored over the accumulated data from the SSC. Once again, Harold and Roy found themselves in Roy's office, discussing the experiments.

"It looks good," Harold told Roy. "We seem to be close to confirming the existence of the Higgs boson." The two scientists tossed the physics back and forth for a while. The Higgs boson, a particle formed only at extremely high energies, was the key particle in the Grand Unification Theory. Discovery of the particle would indicate that three of the four fundamental forces—the strong, weak, and electromagnetic forces—were actually aspects of one overall superforce.

"That still omits gravity," Roy pointed out.

"Who cares? If we can get just one more run out of the other universe's accelerator, we'll have gotten closer than anyone has before. Even Einstein."

Roy nodded. Einstein had spent the last years of his life trying to unite gravity with electromagnetism. If only he had known that gravity would be the hardest force to unite of them all.

"The next step would be an accelerator of even higher energies. Probably have to build it around the Moon." Roy sighed, and smiled. "Too bad we won't be around to see it."

Harold chuckled. "Roy, God Himself could appear in front of you with the one ultimate equation that explains all of physics, and you would shrug and think about how it would put all of us out of work. Forget about it! We've accomplished what we set out to do. Many-worlds and Grand Unification in one year, when just a few years ago we thought the SSC was long dead."

Roy laughed. "It's been a long, hard project, Harold. I'm just as happy as you are, but I'm exhausted from all the political stuff as well as the physics."

"Well, relax. Just one more run of the accelerator, and you, my friend, will be on stage in Stockholm getting your Nobel prize."

7. Spin Up

"That's even more preposterous than your original theory," Ray said. He and Kristin were eating lunch in the cafeteria. The mood around them was somber, and yet people were still joking here and there.

Kristin nodded. "I don't care. We've got less than a month before they close us down forever. I think I have a right to request these runs."

"What possible good could it do?"

"What possible harm?"

"Look, Kristin, I'm busy with a lot of other things. There's paperwork to do, there are reporters to talk to—"

"Why won't you let me try this experiment?"

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Ray put down his sandwich and looked straight at his former student. "Because the truth is, I don't believe you, Kristin. I've been humoring you about this alternate universe stuff. And we've got more important things to do in the final few days of the SSC than test your theory!"

A few people's heads turned at the sound of Ray's voice, but then they quickly went back to their own conversations. Ray's shouting stung Kristin, but not nearly as much as his words did. It took her a moment to find her voice, and when she did, she spoke softly. "You—you don't believe me?"

Ray sighed. "I'm sorry for shouting. Look, Kristin, it's not that I don't think you're doing excellent science. And I wasn't about to kick you off the program because of your strange ideas. I had a friend once who had some very weird ideas on Grand Unified Field Theory, but he did top-notch science otherwise, so—it's just that we don't have time."

Finding her courage, Kristin said, "Let me run it by you one more time, Ray."

Ray turned around to look at the clock on the wall behind him, then looked back at Kristin. "OK, one more time."

She took a deep breath. "Fine. Let's assume, for the moment, that I'm wrong, that I'm talking through my hat. Then you have two choices, either do the runs I suggest or do what's scheduled. If you do my experiment, then yes, I admit, we lose out on whatever data we would have had otherwise. You'd be playing it safe, assuming that the data we'd be getting in these last few weeks would have any value at all.

"But now let's assume that I'm right. Let's assume that there is another universe, and that our current data does indicate feedback from there along an Einstein-Rosen bridge. In that case, whoever is in that other universe has been affecting the beams by taking data. Which can only mean one thing.

"They're doing the experiments that we're supposed to be doing."

"So why do you want to signal them?"

"Well, for one thing, it would be nice to let them know that their days of doing science on the cheap are over, wouldn't it?"

Ray shook his head. "I still don't see the point."

"It's obvious, Ray! If we can get a message through to them, they can get one through to us. If they've gotten good results, they can share them with us! We can present those results to Reichen and maybe, just maybe, Congress won't shut us down!"

"But if you're wrong, then it would be a complete waste of time."

"It's Pascal's wager," Kristin said suddenly.

"What?"

"Blaise Pascal, French mathematician—"

"I know who Pascal is."

"Right. Anyway, he once asked himself if it was worth his time to follow the church, and he set it up as a bet. If God doesn't exist, and you follow the church, you end up wasting a little bit of your time here on Earth.

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But if God does exist, and you ignore the church, the payoff is eternal damnation."

"Those are . . . interesting odds."

"So what's it going to be, Ray? Are we going to take the safe and easy path, and get some last trickle of data which may be worthless? Or will we take the risk that we might be wasting our time, but with a possible payoff that would keep the SSC running?"

Ray looked around him for a moment. All these people, the scientists, technicians, and support staff, about to be put out of work because of a shortsighted Congress. Unless . . .

"What do you want to do?"

Kristin smiled.

8. Spin Down

Harold handed the sheet of paper to Roy, who leaned back in his office chair. "The beams haven't been regular anymore," he said, as Roy studied the data. "We're not getting 'Zing! Zing!' now, but rather, 'Pop! Pop!'" Harold demonstrated with his hands his interpretation of zinging and popping, and Roy found himself unable to keep from laughing.

But this was a serious matter. "Without proper beams, we can't finish the experiment," he lamented.

"You're telling me?" asked Harold. "We're so close, so very close, and all we can do is hope that they send us what we need. I have to tell you, it's got me real worried, Roy."

The last time Roy had seen his friend so visibly distraught was when the proton decay experiments of the 1980s had failed to confirm Volin's personal Grand Unification Theory, called SU(5). Its name had turned out to be as unimportant as the theory, since it had ended up disproved. Oddly enough, it was that same disproving of the theory that had led to the necessity of the SSC.

"Could the shorter beams be due to anything specific?" Roy asked.

"If so, it's got me stumped. The beams aren't cutting off the way my equations predict. It's almost like they're doing it deliberately. But why?"

Roy studied the data again, a listing of the different beam lengths. The shorter beam times did seem fairly self-consistent, as did the longer ones that were interspersed. But what could it all mean? He thought for a moment.

"Harold, let's think this through. If the beams have been coming here, then what's been happening in that other universe?"

Harold's brow furrowed. "Trick question, right? If the beams are coming here, then they're leaving there."

"Which means that they haven't been able to take any data. No beams."

A shocked look appeared on Harold's face. "That means that their experiment, as far as they know, is a failure. And—"

"And their government is probably just as unlikely to fund a failing experiment as ours is," Roy concluded for both of them.

They were silent for a moment, then Harold said, "They can't. They can't shut down their collider. We're so close."

"Well, that just may be what they're

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doing. Unless—"

"Unless what?"

"For the past few months, I've been trying to imagine what it would be like for me to live in that universe. What if I had gotten my collider, and then, just as it seems to be working, the beams keep vanishing? What would I do?"

"What you did in this universe. Keep fighting until the bitter end."

"Right. But what if *we* were the ones losing beams? I would have called you in to examine the data, and what would you have found?"

It took Harold a few seconds. "The physics of the bridge is the same in either universe. I could probably have developed this theory in the other universe as well."

Roy smiled. "Which means?"

Harold's eyes lit up. "Which means that they know about us! So if their collider is in danger of being shut down, they would try to let us know about it!" He snatched the paper out of Roy's hands, studied it for a moment, and whistled.

"It's Morse code. See here, where the data begins to get loopy? It's an SOS!"

"So what does the rest of the message say?"

"Give me a minute. It'll be easier if we use the computer to graph the pulse length versus time. . . ."

It was more like ten minutes until Harold had completely translated the message. Most of the message confirmed their ideas about the other universe. But it ended on a very ominous note.

Harold read, "'Shutdown scheduled in few weeks. Must present data. Do you have any?'" He looked up at Roy, who rubbed his eyes.

"Well, yeah, we do," Roy said, "but how do we share it with them?"

Harold got that twinkle in his eye again.

"You mean, how do we signal them back when we don't have a beam?"

"Yes."

Harold laughed. "Easy. Same way they signaled us, but in reverse. We set up the detectors to turn on and off very rapidly in Morse code, so when they send a beam over to us, they get a staggered disappearance instead of the usual 'zing!' kind. Our communication does depend on their sending us a beam, but we can still communicate. It's a simple application of Heisenberg's Uncertainty Principle and Bell's Theorem. We'll just need a SQUID."

A Superconducting Quantum Interference Device. A tiny integrated circuit cell made with superconductors, about the size of a transistor. Roy nodded. That made sense. They needed to interfere with the quantum mechanical nature of the beams, and both ideas Harold had cited involved quantum interactions. Bell's Theorem, in particular, involved the quantum nature of information transfer. "If you can figure it out—"

"I can."

"Then let's do it."

9. Spin Up

"I don't believe it, sorry," Louis Reichen said.

Kristin jumped up and hit Ray's desk with her fist. "Damn it, Reichen,

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look at it! We've contacted them! They're sharing their data! All we've got to do is keep the SSC running!"

"Kristin," Ray said quietly.

This was not the way to convince Reichen, Kristin realized. She mumbled an apology and resumed her seat.

"Thank you," Reichen said icily. "Now, as I was saying, I do not believe this."

"So what do you think?" Ray asked.

"Frankly? I think that you and Dr. Anderson are grasping at straws, trying to come up with anything to save your pet project."

"You're accusing me of making this up, aren't you?" Kristin asked.

Reichen turned to look at her. "Not in so many words, no."

"But you think I'm lying."

Reichen sighed. "Dr. Anderson, let's say that I do think you're lying. Most likely, I would say that, in desperation, you have come up with some scheme for convincing me to keep the collider running. But I'd much rather not have to put such a thing in my report, if you catch my drift. It wouldn't exactly be to your benefit, and I do have some sympathy for your situation."

He turned back to Ray. "I'm here to supervise the shutdown of the SSC. I have an order here from the DOE that you are to stop running your experiments immediately." He took a paper out of his jacket pocket and handed it to Ray. Ray took it without comment.

Reichen stood up. "We'll be seeing a lot of each other over the next few weeks. I'll try to make the shutdown go as smoothly as possible." With that, Reichen stormed out the door.

"He threatened me. He actually threatened me."

"I noticed."

"You believe me, don't you, Ray?"

"I believe you *now*."

"So what do we do?"

"What do we do?" Ray opened one of his desk drawers and pulled out a piece of paper, which he passed over to Kristin. She read it and whistled.

"Are you serious?" she asked.

"I am."

She waved the paper in Ray's face. "Why didn't you show me this before?"

"I just worked out the physics a few days ago. Besides, I didn't think it would come to this. I thought that once Reichen saw what we had, he'd naturally let us continue."

"But he doesn't believe in the people of the other universe."

"No, so he doesn't believe that they're sharing data with us." Ray took the paper from Kristin and ran his eyes over it. "I think this may be our only option. We just have to convince our counterparts in the other universe to cooperate."

"Ray, maybe we shouldn't attempt this. It sounds too dangerous. Maybe you were right—maybe it's time to end things, here and now."

Ray's eyebrows shot up. He stood up, turned around, and walked to the window behind him. He stared outside, with his back to Kristin. When he next spoke, it seemed to Kristin that he spoke as much to himself as to her.

"You know, back when they were

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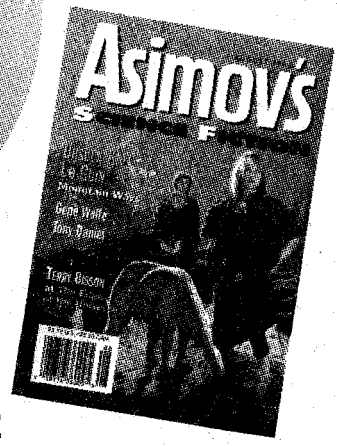

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about to test the first atomic bomb, Enrico Fermi started taking bets on what the bomb would do. There was a small possibility, they said, that the bomb might ignite the atmosphere, and destroy the world completely. If I remember the story correctly, Fermi took the other side of the bet, figuring that if he lost he wouldn't have to worry about paying up."

"I thought he took the side that the atmosphere would ignite, and that he was relieved that he had to pay up."

Ray turned to look at Kristin. "Either way, there comes a time when you have to do the experiment, because—because you just have to." He walked back to his desk, bent over to write a message, and handed it to Kristin. "Here. Send this to them. We'll schedule it for tomorrow afternoon. Make sure Reichen finds out in time to show up. But not in time to stop it."

Kristin took the message and hurried out.

10. Spin Down

Roy Schwitters looked at the group of people he had assembled here on this empty plain, for what he hoped would be a historic first. Harold Volin, of course, who had figured everything out down to the last millisecond; they stood at T minus ten minutes. There were some of the other scientists recruited to work on the SSC as well, gathered around the makeshift cryonic chamber, half the height of a man, which they had managed to construct to contain the SQUID. They had barely an inkling of what was about to transpire.

And finally, mostly recovered but still seeming a bit weak, was Jack Levinson, one of the two teachers who had been witness to the explosion that had first dragged Roy back to the SSC. Levinson kept darting his head around, as if he expected to see another explosion any moment.

Or, perhaps, he expected to see his deceased friend Daniel Strock bicycling over, revealing his death to be a practical joke. Roy shook his head at the depressing thought, and looked away. He didn't mean for today to make up for what Levinson had gone through, but he felt that the man had just as much right to be present as Roy himself did.

Just then, Harold tapped Roy on the shoulder. "Look," he said, pointing in the direction of the afternoon Sun, and away from the scientists gathered around the SQUID. Two figures could be seen emerging from a car, a good distance away. They began to approach the small group of scientists.

"I was afraid this might happen," Roy said. "Let's see what they want."

In less than a minute, the two men stopped in front of Roy and Harold. Roy recognized Sheriff Kingsley, who nodded his head by way of greeting. He looked distinctly uncomfortable, odd for a man who always made himself fit in anywhere.

"Hello, Sheriff," Roy said. "I don't think I remember your friend's name." It was the FBI agent who had tried to coordinate everything at the beginning; Roy had ignored him in favor of Kingsley, which he was now just beginning to think might have

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been a politically bad move.

"Sam Stratton," the agent said by way of reintroduction. "The sheriff told me you would be here." Stratton pointed at Kingsley, who looked at Roy as if pleading for forgiveness.

"What can I do for you, Mr. Stratton?"

Stratton pulled a paper out of the pocket of his blazer and handed it to Roy. "You can pick up and leave. I'm ordering all of you out of this area immediately."

Roy took the paper, smiled, and thrust it back at Stratton without reading it. "Sorry, no can do."

Kingsley cleared his throat and spoke up. "Doc Schwitters, be reasonable. I told this fellow that you would."

Roy shook his head. "Sheriff, we're about to witness something very important here. We can't go just yet."

"Listen to me," Stratton said. "Is it true what Sheriff Kingsley told me? Have you predicted another explosion for this piece of the ring, in just a few minutes?"

"Not an explosion. A beam."

"Same difference, if I understand what's been going on. You're endangering yourself and everyone else here! I'm ordering all of you to move to a safe distance." He waved the paper in Roy's face.

Roy frowned. "Mr. Stratton, I—"

"Roy!" Harold interrupted.

"What is it?"

"I think my calculations were a little off." He pointed behind Stratton and Kingsley. "Look at the SQUID."

Roy turned towards the metal cryonic canister, which held the SQUID inside. "My God."

"It's a trick," Stratton said.

Kingsley turned around, and whistled. "No, it's not."

Slowly, Stratton turned his head around. The air ten feet away from them radiated with thousands of tiny sparks, as if a thousand tiny thunderstorms filled the area with lightning. The scenery behind the area wobbled, as if it was no longer the real three-dimensional world, but a painting done upon a canvas of rubber, stretching in all directions, back and forth. A soft warbling noise slowly increased in volume.

But what made it most frightening was that the other scientists were part of the scenery. Their bodies appeared to stretch, as if they were made of water, with waves passing through them, causing distortions in their shape.

Waves that were heading towards Roy and the others.

Stratton's jaw dropped, and he let the paper fall to his feet. "What in God's name is that?" Stratton exclaimed.

Harold looked at Stratton and smiled impishly. "Wave-function collapse."

11. Spin Down

"They told me you would be here," Reichen said, the sweat moistening his mustache. "I demand to know what's going on."

"Whatever do you mean?" asked Ray.

"I mean, here I have been told that you're running one more beam, against orders, and you're waiting for it to pass underneath your feet."

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"That's right, Mr. Reichen," Kristin interjected.

Reichen swiveled around to face her. "You realize what kind of trouble you're in, doctor? You'll never get another penny from the DOE. Your career in high energy physics is over."

Kristin shrugged. "How melodramatic of you. It was going to be over, anyway, once you killed the SSC.

"But it's not over, Mr. Reichen. And you're right where we wanted you."

Reichen looked around nervously. There were a few other scientists, but they were gathered at a spot a few yards away, chatting among themselves.

"Now what's *that* supposed to mean?"

"It means," Kristin said, "since you showed us that Mohammed wouldn't come to the mountain—"

A loud rumble began to shake the earth under their feet, and a sudden wind gusted up. Reichen looked frightened. Kristin smiled.

"We figured we'd bring the mountain to Mohammed," she finished.

The din got louder. "What the hell's going on?" Reichen roared.

"You didn't believe that the other universe existed," Ray said, as the air around them filled up with sparks of light and the scenery began to wobble. "I thought you might want to tell them that yourself."

12. Spin Sideways

The two universes only coexisted in a small volume, with a radius of about ten meters from where the SQUID sat. The rippling, hazy effect continued, making everyone in the area appear to be submerged in lazily moving water. Roy Schwitters, Harold Volin, Sam Stratton, and Bob Kingsley found themselves almost overlapping with Ray Shwartz, Kristin Anderson, and Louis Reichen. Everyone in the two groups backed off slowly from each other, and regarded each other for a moment. To the people in one group, the people in the other group looked like phantoms, fading in and out of insubstantiality. When the first person spoke, from Spin Up, her voice sounded distorted to the people from Spin Down. But they barely noticed, as someone from Spin Down spoke at exactly the same time, and said exactly the same words.

"It's you!" Kristin said to Ray, pointing at Roy.

"It's you!" Harold said to Roy, pointing at Ray.

The two directors approached each other, cautiously. Through hand gestures, the one from Spin Up deferred to the one from Spin Down.

"I'm Roy Schwitters, director of the SSC."

"That's funny. I'm Ray Shwartz, director of the SSC. In *my* universe, I mean."

They smiled, and attempted to shake hands. Their hands passed right through each other.

Ray looked over his shoulder, back at Reichen, who stood goggle-eyed in shock. "I think we may have proven our point."

Harold and Kristin approached each other with similar caution, and introduced themselves. Harold laughed, and Roy turned to him. "What's so funny?" he asked.

"Talk about your Grand Unification

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Theories," Harold said, and then the universes separated.

Epilogue: Spin Down

Jack Levinson dismounted from his bicycle and removed his helmet. He wiped the sweat from his brow, reached for his thermos, and took a long drink of cool water. It was still the dry grassland, and it was still the SSC ring buried underneath, but it was no longer the same.

According to the Morse code communications, Ray Shwartz and the scientists in the other universe had gotten the go-ahead to continue running the SSC. As Roy Schwitters and the scientists in this Universe gathered data, they would continue to share it with the other universe.

Meanwhile, both Harold Volin and Kristin Anderson were working on the possibility of creating a stable bridge between the universes.

But none of it mattered much to Jack. His friend Daniel had died. It ended up not having been in vain, but still, it was all over for him. Like it had been all over for the SSC, just a few years ago.

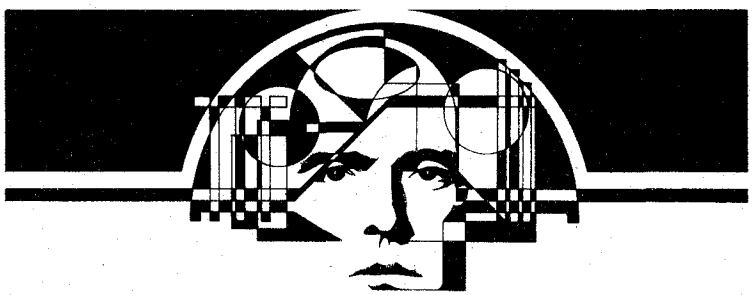
But, Jack noted, with the discovery of the other universe, possibilities had opened up. There was another SSC, another Schwitters, another—

Perhaps there was another Jack in that universe.

Or perhaps . . . perhaps there was another Daniel in that universe, or in another one. . . .

His heart feeling a little lighter, Jack got back onto his bicycle and headed home. ■

With thanks to the Roy Schwitters of our own Universe.



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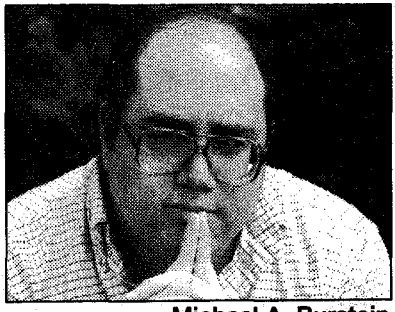
BIOLOG Jay Kay Klein

Michael A. Burstein belongs to the generation of science fiction writers that grew up shaped by the science fiction that an earlier generation was creating. He read SF as far back as he can remember. In *Analog*'s earlier days, most people had hardly ever heard of SF, and few children read it because there was almost nothing intended for them. The readers were virtually all males. Michael met his wife in college, where she introduced him to SF fandom and conventions. That's when he decided to write SF.

He had tried writing SF as a teenager, but in modern times this requires a tremendous amount of knowledge and a well-polished style. Hunter College high school for gifted students made a good start, and a B.A. from Harvard in Physics continued Michael's education towards selling stories to *Analog*, the premier hard science SF magazine.

A master's degree in physics came next from Boston University. He found that the single-minded pursuit of degree requirements and a continuing narrow vision on research dictated by a group leader formed a pretty deadly present leading to a very dull future. Michael decided to pursue self-directed parallel coursework leading to the equivalent of a master's degree in SF writing. He read every useful book on writing he could find, studying characterization, plot, structure, dialog, and the specialty area of SF. His homework consisted of writing story after story.

While earning a living as a high school teacher in New York City, he continued writing, and eventually got a personal rejection slip from Dr. Schmidt. Then, a story about the future of the Internet as a Virtual Reality classroom drew a detailed analysis from Dr. Schmidt of the story's problem areas. The two discussed these at a local SF convention. Michael then attended the famous Clarion SF and fantasy writer's workshop where he worked out improvements. The written story appeared in the July 1995 *Analog*, winning the AnLab vote for



Michael A. Burstein

Photo by Nomi Burstein

(Continued on page 152)

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Ben Bova

THE NEW ERA—PART II

Our latest update in the fast-changing search for extraterrestrial life. . . .

Well . . . I told you so.

In the June 1996 issue of this magazine I reported, "A new era has begun in the quest to find extraterrestrial life."

In August 1996, NASA researchers reported that microscopic structures found in a meteorite may be fossils of Martian bacterial life forms some 3.6 billion years old.

Coming on top of the discoveries of half a dozen planets orbiting Sunlike stars—including one planetary system that is only 8.1 light-years away—the discovery of possible Martian fossils has launched the new era well and truly.

Visitors from Space

The Earth is constantly bombarded with meteoroids, chunks of rock, and metal that are thought to be leftovers from the earliest days of the Solar System's formation. Astronomers estimate that about 100 tons of meteoroids fall onto the Earth each year.

Meteorites are the recovered remains of meteoroids that have survived flight through Earth's atmosphere. The idea that they might harbor life inside them is not new. More than 30 years ago, chemist Bartholomew Nagy announced his discovery of the remains of once-living cells inside a carbonaceous chondritic meteorite.

However, all such claims have eventually been discredited as nothing more than terrestrial contamination: microscopic Earth life that invaded the meteorite once it landed here.

NASA's announcement is different.

For one thing, the meteorite—ALH84001—almost certainly is of Martian origin. Found in Antarctica ten years ago, ALH84001's chemical composition closely matches the chemical composition of the Martian surface gleaned by the Viking landers in 1976.

Altogether, 12 Antarctic meteorites are suspected of originating on Mars; ALH84001 is the oldest of them, dat-

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ed at some 3.6 billion years old. Apparently they were blasted off Mars by the powerful impact of much larger meteoroids during an early era in the Solar System's formation, the same era that scarred the face of the Moon.

ALH84001 wandered through interplanetary space until about 13,000 years ago, when Earth's gravity captured it and it fell into the perpetual snow and ice of Antarctica. It was discovered ten years ago and identified as Martian in origin by chemical analysis.

Up to two years ago, the Martian meteorite languished in a storage locker in the Johnson Space Center, near Houston. Earlier probes of the rock had found nothing extraordinary; the tools to search for nanometer-scale microfossils didn't exist until roughly 1994.

Martian Life?

Using scanning electron microscopes and laser spectroscopy on a nanometer scale, NASA researchers discovered:

(1) Carbonates and organic molecules known as polycyclic aromatic hydrocarbons (PAHs) concentrated in specific areas inside the 1.9-kilogram meteorite. On Earth, PAHs are produced by the decay or combustion of plants and other organisms, although they can also be produced by nonbiologic sources.

(2) Mineral compounds such as iron sulfide and magnetite, which on Earth are commonly produced by anaerobic bacteria and other microscopic organisms, but which—again—could possibly have a nonbiologic origin.

(3) Nanometer-scale tubular and egg-shaped structures that resemble the fossils of ancient, single-celled bacteria found on Earth. Moreover, the PAHs, the compounds and microstructures all lie within a few hundred thousandths of a centimeter of each other.

ALH84001 has been sitting on the Antarctic ice field for some 13,000 years; could it be contaminated with terrestrial PAHs or other organic materials? Unlikely: the NASA team's analysis shows that the concentration of PAHs increases from the meteorite's crust to its interior—exactly the opposite pattern you would expect if the organic molecules were Earthly contaminants.

Each link in this investigative chain is open to some doubt: Is the meteorite really of Martian origin? Are the chemicals of biologic or nonbiologic origin? Are the microstructures indigenous or terrestrial contaminants? Are they truly fossils or merely mineral formations?

Speculation and hunches are now giving way to scientific study and debate.

NASA chief scientist Wes Huntress told me that the agency has sent "literally hundreds" of samples of the meteorite to researchers all around the world. Over the coming months, investigators will make their observations and argue about their interpretations. Irrefutable evidence will probably have to wait until humans arrive on Mars and start digging.

Ubiquitous Bacteria

When you stop to think about it,

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we should not be surprised that the first discovery of extraterrestrial life might be bacteria.

As mentioned in my earlier article, scientists have found anaerobic bacteria (dubbed SLiMES) living miles below the surface of the ground, metabolizing rock and underground water without the need for sunlight. Life on Mars, where the surface is freezing, arid, and bathed in lethal radiation, may well have gone underground and stayed there.

outweigh all other life forms on Earth, he estimates.

Bacteria, Gould says, "may . . . represent life's only common mode throughout the Universe."

He notes that "the environment of the Earth's shallow interior—liquid flowing through cracks and pore spaces in rocks—may be quite common on other worlds, both in our Solar System and elsewhere (frozen surfaces of distant planets will not permit life, but interior heat may produce liquid—

TABLE 1
PLANETS DISCOVERED AROUND OTHER SUNLIKE STARS

Star	*Distance**	*Period***	*Mass#*	*Notes*
51 Pegasi	0.05	4.3 days	0.5	1st "HJ"
47 Ursa Maj.	2.1	3.02 years	2.4	
70 Virginis	ecc.	116.7 days	6.6	BD?%
55 Cancri	0.11	14.76 days	0.8	"HJ"
55 Cancri	>5	unk.	>5	
HD 114762	ecc.	84.01 days	10	BD?
Tau Bootis	0.0047	3.31 days	3.7	"HJ"
Upsilon And.	0.054	4.61 days	0.6	"HJ"
Lalande 21185	2.2	5.8 years	0.9	astrometric
Lalande 21185	11	30 years	1.1	" (?)

* Planet-to-star distance (AU = 1)
** Orbital period ("year")
# Lower limit on mass, Jupiter = 1
"HJ" = "Hot Jupiter"; BD = Brown Dwarf

Paleobiologist Stephen Jay Gould points out in his most recent book, *Full House*, that bacteria are the most common and abundant life form on Earth. They arose as soon as life could begin on an Earth still cooling from its hot origins. They have filled every ecological niche, from boiling deep-sea vents to the stratosphere. Pound for pound of living protoplasm, they

and a possible environment for life at bacterial grade . . . underground . . .)"

He cites astronomer Thomas Gold, who states that, "there are at least ten other planetary bodies [including several moons of the giant planets] in our Solar System that would have had a . . . chance for originating microbial life" below their surfaces.

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What about planets of other stars?

Extrasolar Planets

When the first discoveries of planets orbiting other, Sunlike stars were announced late in 1995, they rocked the astronomical community.

Within six months, such discoveries were becoming almost "ho-hum."

Almost.

Table 1 shows what has been discovered as of this writing (August 1996). New discoveries have been popping up with great frequency, however, so the chances are that more have been found by the time you read this.

If these extrasolar planets have taught us anything, it is that not all planetary systems are built the same way as our own. We have a lot to learn!

A new class of planets has been discovered: "hot Jupiters," planets of Jovian size and mass, but orbiting so close to their stars that their surfaces must be broiling at more than a thousand degrees Celsius. Nothing like this was anticipated.

Which goes to show that the more you know, the more you realize there is still to be learned.

One of the newly discovered planets is in a "Goldilocks" orbit, where liquid water could exist on its surface. Several of them are suspected to be brown dwarfs ("failed stars") rather than true planets.

A Bit of Background

For generations astronomers have been searching for planets orbiting other stars—extrasolar planets. The problem has always been that the stars are so distant, and planets so small and dim, that there was no hope of seeing extrasolar planets directly. Instead, astronomers tried to measure the tiny wobbles in stars' straight-line motion across our field of view (called *proper motion*) that would be caused by the gravitational tugs of planets.

Peter van de Kamp at Swarthmore College's Sproul Observatory claimed, in the 1950s, to have detected through this *astrometric* technique "unseen companions" to several nearby stars, including Barnard's Star, the second closest star to the Sun (6.1 light-years) and Lalande 21185 (8.1 light-years).

But van de Kamp's results were never corroborated by other astronomers. Eventually, they were disregarded.

More recently, astronomers began looking for evidence of extrasolar planets by studying the spectra of stars. A star's spectrum would show periodic Doppler shifts if a planet were tugging at it gravitationally. This spectroscopic technique can show very slight approach-and-recede velocities, and thus could detect much smaller motions than the earlier astrometric technique.

51 Pegasi

In October 1995, Michael Mayor and Didier Queloz of the Geneva Observatory, in Switzerland, announced the discovery of a planet orbiting the Sunlike star, 51 Pegasi, which lies 42 light-years from the Sun. Their discovery was quickly confirmed by Geoffrey W. Marcy and R. Paul Butler of San Francisco State University and the

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University of California at Berkeley.

You can see the star 51 Pegasi on a clear, dark night. It is just visible to the naked eye, slightly in front of the leading (westward) edge of the Great Square of Pegasus, a favorite sight for stargazers.

A yellowish G4 star, with an absolute magnitude of 5.0, 51 Peg is a little cooler than the Sun, and slightly dimmer. (Our Sun is spectral class G2, and has an absolute magnitude of 4.8.) This implies that 51 Peg is definitely a stable, Sunlike, Main Sequence star.

The planet orbiting 51 Peg is at least half the mass of Jupiter, yet its orbit is only seven million kilometers from its parent star, less than one-eighth the distance of Mercury from our Sun. It orbits around 51 Peg in just 4.3 days. Its surface temperature has been calculated to be 1300°C. A "hot Jupiter," the first of several such planets to be discovered.

How can such a massive planet—bigger than Saturn—exist so close to its star? At first glance, it would seem likely that if you towed Jupiter or Saturn that close to the Sun most of the planet's deep atmosphere, predominantly composed of hydrogen and helium, would be quickly boiled away into space. After all, the temperature at Jupiter's "surface"—the tops of its clouds—is on the order of -150°C. Saturn is even colder.

However, calculations have suggested that, once formed, such a massive planet would be able to hold on to most of its material even at that high a temperature. Perhaps 51 Peg B, as the planet is dubbed in the official jargon of the astronomers, was formed at a Jupiter-like distance from its star and then somehow (!) spiraled in to its present snuggly-close orbit.

So, either 51 Peg B was born at least five times farther from its star than it is now, or it is composed very differently from the gas giants of our Solar System.

A Brown Dwarf

Also in October 1995, Shrinivas Kulkarni and colleagues at the California Institute of Technology in Pasadena announced their discovery of a body some 20 to 60 times the mass of Jupiter orbiting the red dwarf star GL229, which is 30 light-years from us. GL229's companion orbits the star at a distance of about 44 astronomical units (AUs)[1] slightly farther from GL229 than Pluto is from our Sun.

GL229 B, as it is officially dubbed, is most likely a brown dwarf, a "failed star" that does not quite have enough mass to initiate the fusion reactions in its core that would have made it a true star. Methane and water vapor have been detected in its spectrum, which implies a surface temperature below 1315°C. If it were a true star, its surface would be too hot for either methane or water vapor to exist.

Calculations have shown that a body must be 75 to 80 times more massive than Jupiter in order to sustain nuclear fusion reactions in its core. GL229 B is only about 20 to 60 times Jupiter's

[1]The astronomical unit (AU) represents the average distance between the Earth and the Sun, roughly 93 million miles. It is used as a "yardstick" in discussing interplanetary distances.

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mass; too small to be a star, but very likely a brown dwarf. Brown dwarf stars would radiate in the infrared, giving off heat from their slow contraction. GL229 B was detected by infrared sensors and photographed both in the infrared and in visible light by the Hubble Space Telescope.

Of all the extrasolar planets discovered so far, GL229 B is the only one to have been actually seen, thanks mainly to its distance from its parent star, and the dimness of that parent.

Goldilocks . . .

Marcy and Butler, in California, had been monitoring the motions of 120 stars for more than seven years with a spectrograph mounted on a 120-inch telescope at Lick Observatory. When Mayor and Queloz made their 51 Peg announcement, Marcy and Butler checked their data and confirmed the discovery of the planet.

Then they searched frantically through their own records of the first 60 of the 120 stars they had been monitoring, hoping to find evidence for another planet.

They found several.

Most exciting of all is the discovery of a planet that has been called "Goldilocks," because its orbit is not too close, and not too far from its star for it to be at just the right temperature to bear liquid water on its surface.

There is only one other world in the Universe that we know bears liquid water on its surface, and that planet—Earth—also bears life.

Does Goldilocks?

Goldilocks orbits the star 70 Virginis, a star of spectral class is G0, with an absolute magnitude of 5.0. This makes it just a tad hotter than the Sun, but slightly dimmer. Although Goldilocks (or 70 Vir B) is at least 6.6 times more massive than Jupiter, it orbits closer to its star than Venus does to the Sun—another "hot Jupiter." Its "year" takes only 116.7 days.

While its highly elliptical orbit is entirely within the zone where liquid water could exist on its surface, its high mass has led some astronomers to theorize that Goldilocks is not truly a planet, but another brown dwarf. And the fact that liquid water *could* exist on Goldilocks' surface does not necessarily mean that it *does*.

. . . And the Big Bear . . .

The second planet Marcy and Butler found orbits 47 Ursa Majoris, and is the most like the kind of planet to be found in our own Solar System. The star is also spectral type G0, with a magnitude of 5.1, visible to the naked eye below the "bowl" of the Big Dipper (which is a part of the Big Bear constellation).

The mass of the planet orbiting 47 UM is about 2.4 times that of Jupiter, and its distance from its star is some 300 million kilometers, corresponding to an orbit between those of Mars and Jupiter in our Solar System. Its orbital period (year) is slightly more than three Earth years.

The Big Bear planet would not look terribly out of place in our own Solar System; its orbit is in the area where our asteroid belt exists. But to date it and only one other planet have been found that resemble anything in our Solar System. The other planet orbits

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Lalande 21185 (more on that shortly).

. . . And the Crab

In April 1996, Marcy and Butler announced the discovery of another planet, this one orbiting the Sunlike star 55 ρ Cancri, some 45 light-years from us, in the constellation Cancer, the Crab.

Like 51 Peg B, the Crab planet is of Jovian mass yet orbits only 16 million kilometers from its star, about one-third of Mercury's distance from the Sun. It spins around the Crab star every 14.76 days. Another "hot Jupiter."

Again, theorists suppose the Jupiter-sized planet originated farther out from its parent star and spiraled in to its present torrid-zone orbit.

A second planet has been reported orbiting 55 ρ Cancri, more than 5 AU from the star, and with a mass of more than five Jupiters. "Hot Jupiters" have also been found near Tau Bootis and Upsilon Andromedas, while a brown-dwarf candidate has been detected orbiting the star HD114762.

Van de Kamp Vindicated?

It gets even more interesting.

In June 1996 George D. Gatewood, director of the University of Pittsburgh's Allegheny Observatory, tentatively announced the discovery of *two* planets orbiting Lalande 21185, at 8.1 light-years distance, the fourth closest star to the Sun (counting Alpha Centauri as a single entity consisting of three stars).

A dim red dwarf star that is racing across our field of view, Lalande 21185 was one of those stars which van de Kamp claimed as possessing "unseen companions" some 40 years ago.

Like van de Kamp, Gatewood used the astrometric technique for measuring the star's proper motion, although he had the benefit of modern electronics as he tracked the star's motion from 1988 to the present with a multichannel astrometric photometer (MAP) photoelectric detector.

Gatewood calls his findings tentative because the more massive of the two planets needs 30 years to complete its orbit around the red dwarf star, and he has only eight years of data on hand. But he believes that Lalande 21185 has a planet of almost Jupiter's mass orbiting at 2.2 AUs, which would be between the orbits of Mars and Jupiter in our system. Its "year" is almost six Earth years.

At 11 AUs' distance is a second planet of about 1.1 times Jupiter's mass; this is the one that orbits Lalande 21185 in 30 years. In our Solar System, Saturn's orbit is 9.54 AUs from the Sun; its "year" is 29.46 Earth years.

When informed of the Lalande 21185 discovery, tentative though it may be, theorist Alan P. Boss of the Carnegie Institution of Washington DC said, "this is the place to look for an Earth-like planet." Butler and Marcy have detected no evidence of a wobble in Lalande 21185's motion, but they say this is inconclusive, since positive confirmation—or refutation—of Gatewood's discovery will take 30 years of patient observation.

Meanwhile, Back at Jupiter

Even in our own Solar System, the more we learn, the deeper the puzzles we face. The data returned from

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the *Galileo* spacecraft's probe have puzzled astronomers: Yes, organic molecules exist in the upper clouds of the Solar System's largest planet, good news for seekers of life. But Jupiter shouldn't be the way the probe's instruments found it. Not if it was created the way standard astrophysical theory believes it should have been.

And where's the water vapor?

Most planetary astronomers had assumed that Jupiter was composed of very much the same mix of elements that the Sun is. Yet the region of Jupiter's atmosphere sampled by the *Galileo* probe appears unusually dry, containing only one-fifth the abundance of water that would be expected from the Sun's oxygen-to-hydrogen ratio.

After revising their estimates twice, and checking them on a carefully calibrated duplicate of the spectrometer aboard *Galileo,* scientists have reluctantly concluded that Jupiter's upper atmosphere truly is much drier than expected.

In addition to the disappointing spectrometer readings, other detectors on the probe also found evidence of a "dry" Jupiter: a dearth of water clouds, the relative rarity of lightning, and infrared emissions that would have been blocked if water were abundant in the atmosphere. These all point to the conclusion that Jupiter contains much less water than standard planet-building theory predicts.

According to Andrew P. Ingersoll, an atmospheric scientist at the California Institute of Technology, *Galileo*'s findings raise three possibilities:

1. The probe may simply have entered a Jovian "desert" area, an anomalously dry region that bears little resemblance to the rest of the atmosphere. Earth-based observations indicated that the outer portion of the entry site has little water. However, you would expect that Jupiter's persistent winds, which blow at 200-300 mph or more, would have thoroughly mixed water vapor throughout the planet's atmosphere—if water vapor is in the atmosphere at that altitude.

2. Perhaps Jupiter contains plenty of water, but it remains locked as ice in the planet's core, far below the levels reached by the probe.

3. Maybe Jupiter really is dry and its core was built from carbonaceous chondritic meteoroids, which contain relatively little water, instead of water-rich comets. This would explain both the lack of water and the surprisingly high ratio of carbon to oxygen that *Galileo*'s spectrometer detected.

The University of Arizona's Donald M. Hunten, who reported the latest *Galileo* analysis at the annual Lunar and Planetary Science Conference in Houston in March 1996, pointed out that even in the outer reaches of the Solar System, rocky debris rich in carbon may be surprisingly plentiful.

As astronomer George W. Harper predicted in *Analog*'s November 1973 issue, the distinction between comets and meteoroids may not be clear-cut. Some objects now regarded as comets may be more like ice-covered rocky meteoroids than typical cometary "dirty snowballs." Jupiter may have been built up from water-poor meteoritic bodies, rather

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than water-rich comets.

What Have We Learned?

First, the Martian meteorite findings—if true—show that microbial life existed beneath Mars's surface about 3.6 billion years ago, the time that microbial life was getting started on Earth. We are not alone.

Future explorations of Mars, whether robotic or human, should be equipped to dig deep in the search for fossils. Perhaps (and this is a long stretch) some forms of life still exist on or inside Mars. The possibilities, though slim, are exciting.

Next, the *Galileo* probe results appear to be telling us that Jupiter did not form out of a core of water-rich icy bodies, as presumed by most theorists, but from water-poor rocky bodies. That core, theorized to be about ten times Earth's mass, then pulled in some 300 Earth masses more of gases and (presumably) dust particles from the solar nebula.

But if *Galileo*'s instruments are to be believed, the solar nebula did not have the same ratio of oxygen to hydrogen that the Sun's outer layers now display.

As far as the extrasolar planets are concerned, of all planetary-type bodies discovered so far, only the one orbiting the Big Bear's 47 Ursa Majoris closely resembles a Jupiter-like planet. Its mass is about 2.3 times that of Jupiter and its orbital radius is close to where Jupiter orbits in our Solar System.

Of course, if the findings at Lalande 21185 turn out to be true, then we have discovered a planetary system very much like our own, practically in our backyard. Lalande 21185 is close enough to give strong hope that we could detect Earth-sized planets there—if any exist.

The companion of GL229, at 20 to 60 times Jupiter's mass, is most likely a brown dwarf, rather than a planet.

Goldilocks, orbiting 70 Virginis, may be a brown dwarf also. At 6.5 times Jupiter's mass, the distinction between planet and brown dwarf is difficult to draw. However, as Hal Clement showed in his classic novel *Mission of Gravity,* a body even 16 times the mass of Jupiter might not only be a planet, but a life-bearing one.

Hot Jupiters

In the search for extrasolar planets, astronomers have discovered a new and unexpected class of worlds: "hot Jupiters," planets of Jovian mass that orbit blazingly close to their stars.

The companions of 51 Peg, 55 ρ Cancri, Tau Bootis and Upsilon Andromedas are all at least half the mass of Jupiter, which definitely puts them in the "planet" category, yet their scalding-close orbits raise the double-barreled question of how such massive planets could form so close to their stars *or* how they could have spiraled in to their present orbits, assuming they formed at Jovian distances originally.

David C. Black, director of the Lunar and Planetary Institute, Houston, believes that of all these extrasolar planetary bodies (ignoring the tentative discovery at Lalande 21185), only 47 Ursa Majoris B can definitely be classed as a planet. The others are all brown dwarfs, in his opinion.

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Moreover, Black has pointed out that fairly extensive searches for extrasolar planets should have discovered more of them by now, if single stars form planetary systems as a matter of course. As Sherlock Holmes observed when the dog did not bark at night, sometimes the lack of a phenomenon is the significant clue.

Is our Solar System unique, or very rare? The answer, at this moment seems to be, a qualified "no." We have discovered at least eight single stars—that is, stars that are not binaries or triplets, etc.—that are accompanied by dark companions. Even if most of them are brown dwarfs, it still shows that single stars spin off companion bodies.

How prevalent are planetary systems? This question is crucial to the likelihood of discovering extraterrestrial life. The answer has to be, tentatively, not very damned prevalent. As Black has pointed out, dedicated scans of the sky that have been underway for a decade or more have only recently discovered a few extrasolar bodies.

Yet the possibility of a planetary system much like our own at Lalande 21185, little more than eight light-years away, gives the hope that Black is overly pessimistic.

And the discovery of possible life on Mars, one of our nearest planetary neighbors, points to the possibility that life may be commonplace, even on planets that are frozen and airless.

Naturally, these first discoveries of extrasolar planets are very massive bodies: either brown dwarfs or Jovian in size. It is to be expected that the more massive a body is, the easier it will be to detect. Also, a massive body orbiting *close* to its parent star displays Doppler wobbles that are easier to detect. The 4.3-day wobble of 51 Peg is easier to detect than a many-years-long perturbation from a body of similar mass.

Do we understand how planetary systems are formed? Not well enough! Even nearby Jupiter has stumped astronomers who thought they knew how gas giant planets are made. And the "hot Jupiters"—Jovian-sized planets with the Mercury-type orbits—make it clear that there are more tricks in the cosmological bag than we had thought possible.

Also, remember that the first extrasolar planets to be discovered orbit the pulsar PSR B1257+12; they were detected by radio astronomers. Most astronomers feel that these planets (there are at least two of them) must have formed *after* the supernova explosion that wrecked the original star, accreting out of the debris cloud blown off when the star exploded. Nobody thought of that possibility before, not even science fiction writers!

Meanwhile, NASA is mulling plans to seek out Earth-like planets by building Planet Finder, an infrared interferometer to be erected in space three or four AUs from the Sun. At that distance the instrument could avoid the zodiacal light caused by interplanetary dust lit up by the Sun. The orbiting interferometer might consist of four telescopes, spaced with a precision of a few angstroms over a distance of perhaps a kilometer.

Richard Terrile, a planetary as-

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tronomer at NASA's Jet Propulsion Laboratory (JPL) has suggested using a balloon-born 1.5-meter telescope, which he has dubbed High-Altitude Balloon Circumstellar Imaging Telescope (HABCIT), as a first step toward imaging extrasolar planets. He claims HABCIT could be operational in three years at a cost of $25 million. NASA's Planet Finder is estimated to cost one to two billion dollars, and won't be ready until 2015. Planet Finder will provide spectrographic data, however, which Terrile's "quickie" three-week balloon flight will not.

The chance of finding Earth-like planets might be enough of a spur to get the taxpayers' support, especially with the possibility of such planets a "mere" 8.1 light-years away.

The more you know, the more you realize you don't know. But we know more than we did a year ago. There may have been life on Mars; there might even be life there today. Our hopes and plans for exploring the red planet should be accelerated.

And if the Lalande 21185 discovery is confirmed we should start thinking seriously of sending uncrewed probes out on the first interstellar mission.

There's an awful lot to learn. ■

References

David C. Black, "Completing the Copernican Revolution: The Search for Other Planetary Systems," *Annual Review of Astronomy and Astrophysics,* 1995, 33:359-380.

David C. Black, "In Search of Other Planetary Systems," *Sky & Telescope* (in press).

Ben Bova, "Extraterrestrial Life: A New Era Begins," *Analog Science Fiction and Fact,* June 1996, p. 60.

Hal Clement, "Whirligig World," *Astounding Science Fiction,* June 1953, p. 102.

Ron Cowen, "Revised Galileo results pose Jovian puzzle," *Science News,* 30 March 1996, p. 199.

Ron Cowen, "Uncertainties greet latest planet finds," *Science News,* 15 June 1996, p. 373.

Donald Goldsmith, "Seeking Out Strange New Worlds," *Science,* 2 February 1996, p. 588.

Stephen Jay Gould, *Full House,* Harmony Books, New York, 1996.

George W. Harper, "Styx and Stones, and Maybe Charon Too," *Analog Science Fiction/Science Fact,* November 1973, p. 64.

Govert Schilling, "'Hot Jupiters' Leave Theorists in the Cold," *Science,* 26 July 1996, p. 429.

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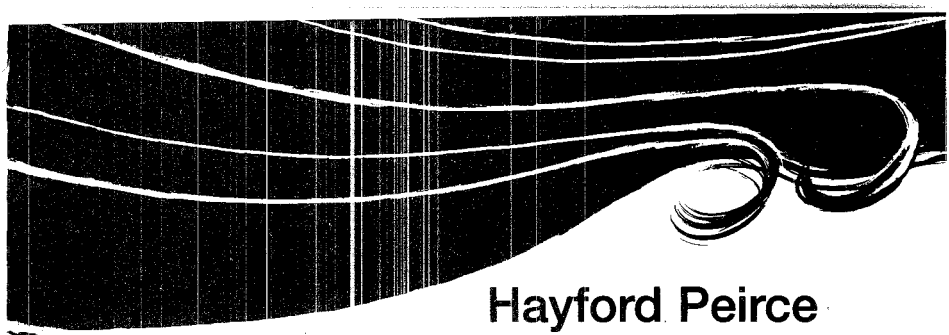

Hayford Peirce

THE BOXIE REBELLION

The setup gave new meaning to the phrase "boxed in." But was there a way out?

Illustration by Kelly Freas

"What do you know about this proposed issue of tunnel bonds?" demanded my lord and master, J. Davis Alexander.

"Which tunnel bonds?"

"The ones on the Moon, of course, Earth's Moon." The managing director of Hartman, Bemis & Choupette scowled at me balefully, the way he generally did just before making the announcement that I was fired.

"Oh, *those* tunnel bonds." Without being asked, I let myself sink slowly through Ceres' 4 percent gravity into a chair in front of J. Davis Alexander's enormous desk of gleaming green

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malachite. Through the windows of his fine corner office I could see a family of ducklings splashing happily in their pond in Westlake Park, Clarkeville's choicest piece of prime real estate. I hooked my toes under the footbar to keep from floating away if I pounded the desk too vehemently and shrugged dismissively. "The Kennedygrad ones?"

J. Davis Alexander nodded.

"They're just like most of the other tunnel bonds the Loonies've issued over the last hundred years or so," I said, "medium low-grade investment quality, some risk attached, but a long way from being junk bonds. They're issuing a round billion dollars' worth, U.S. Earth dollars, and they'll probably be priced to yield about 8.75 percent."

"Well, there's been a change. Now they're thinking about issuing them to yield Belter buckles instead of dollars. That way they could save a couple of points on the interest rate. Over thirty years there'd be a tremendous savings."

"Of course." Belter buckles, backed by all the gold in the Asteroid Belt, were the safest, most stable currency in the Solar System and always commanded a hefty premium. "But are the bonds themselves going to be buckle denominated? So far as I know, none of the tunnel financing has ever been underwritten from the Belt."

J. Davis Alexander pushed himself back in his red leather chair and looked as deeply satisfied as it's possible to look if you're roughly globuloid in shape, almost entirely covered with thick wiry hair, and have the eyes and disposition of a famished wolverine. "Exactly, White. Think what a coup it would be for HB&C to underwrite an entire issue of this size—*and* to denominate it in Belter buckles. Overnight we'd be major players in the Solar System fincweb, White, major players!"

And wealthy ones, too, I mused, reluctantly admitting that my cunning and far from irreproachably scrupulous boss might for once have found a reasonably ethical means of generating a stupendous amount of money. "The people in Kennedygrad who're building this tunnel have already agreed to us being the underwriters?"

"Not yet, White, not yet. And that's where you come in."

"I?" *I* was Jonathan Welbrook White, Ethical Broker & Bourseman for more years than I cared to think about in the employ of the Belt's second largest brokerage house.

"Yes, *you*. They're not playing fair, you know, White. They're also dickering with the Three Blind Mice about handling the issue."

"Oh." The Three Blind Mice were Bleine, Blinder & Miesen on Pallas, the Belt's largest firm and our most hated archrivals.

"The fact that they're talking with *them* leads Mr. Choupette to suspect that this underwriting might not be as squeaky clean as we'd like it to be."

"Or as profitable."

"Exactly. Which is why you're leaving on the next Moon-Earth packet, White, to check out this deal in person."

"But I'm not a bond specialist," I

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protested. "In fact I know almost nothing about them except how to calculate their yield. And, as you may recall, I've just come *back* from Earth—*you* sent me there inside an ore-ball that nearly froze me to death!" I surged to my feet, taking care not to bounce my head off the ceiling. "Thank you, no. It's *your* turn to go to Earth. You may fire me now or upon your return."

J. Davis Alexander's fleshy lips tightened. "You made, as *you* might recall, a tidy bonus for going to Earth, as well as some nice capital gains. And there's another bonus waiting for you here in this job, White. Now sit down and let me tell you what else you're going to be doing on the Moon."

"Tell me again what tunnel bonds are," said Jin Tshei as we lingered over dinner in the first-class dining room of the *Vesta Explorer*. It was the third day out from Ceres and we were still accelerating at a constant .075 gravities en route to our rendezvous with the Moon in another twenty-four days. "I'm afraid I wasn't paying attention before."

I sipped at the glass of genuine Terran cognac that had popped out of the wall dispenser at my elbow. "Well, bonds are—"

"I know what bonds are," snapped Jin Tshei. "After hanging around *you* for eight years, I'd have to be an idiot not to. But what's a *tunnel* bond?"

"Oh. Well, I'm not much of a Moon specialist except for tracking those mining companies that compete with ours, but their preferred method of transportation between Lunar cities is by high-velocity tunnel trains. They're electromagnetically accelerated and reach nearly a thousand klicks an hour. The Loonies've been gradually expanding the network between their cities and settlements and mining sites and whatnot for two centuries now—and constantly rebuilding the old ones. So they're always raising money, generally through bond issues, in order to finance the next tunnel from Hither to Yon."

"I see." Jin Tshei batted her long eyelashes at me over her glass of Kahlua and cream and I felt a momentary weakness in my knees. Except for the former Miss Grain Harvest of 2273, J. Davis Alexander's improbable trophy wife, Jin Tshei was almost certainly the loveliest girl in the entire Belt. She had skin the color of golden honey, glossy black hair that fell nearly to her waist, and enormous almond eyes in the most delicate heart-shaped face imaginable. From time to time I was stabbed by a terrible pang of jealousy that this ethereally beautiful creature was the legal wife of my girlfriend, Isabel, instead of my own.

Eight or nine years earlier, when Isabel and I decided to marry, we received a rude shock in the form of an absolute refusal from Psych Service to issue a license. The psychological and genetic profile of Isabel, they said in their dogmatic way after the mandatory testing, revealed a latent attraction to other women that made our chances of having a successful twenty-three-year marriage something less than 48 percent. That assessment had come as a vast surprise to Isabel, who had always considered herself as

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straight as a mathematician's line, but who could argue with Psych Service? Which was why I was now traveling to the Moon in the company of the gorgeous Jin Tshei.

It was all very simple—if you're a Cerean.

If you want to have children, you have to be able to guarantee a stable family environment until the child reaches his or her 22nd birthday.

Psych Service defines a successful marriage as being 75 percent likely to go the term. Our proposed union was in the 48-percent bracket. So, unless we wanted to migrate to another of the semi-autonomous Belt worlds with a less restrictive parenting code, there could be no wedding bells for Isabel and Jonathan.

So Isabel married the breathtakingly beautiful Jin Tshei, who was taller than Isabel and not quite as well rounded in those places that I myself find particularly interesting, and after a suitable honeymoon interval I was invited to contribute the necessary genetic material for the creation of a darling baby girl.

And so Isabel and Jin Tshei and little Valerié-France lived happily ever after—at least in the eyes of Psych Service—and Jonathan came by for occasional weekends and family dinners and was reasonably satisfied with the whole situation.

Except for the fact that Vally was soon discovered to be a victim of the rare Kesler's Syndrome, which required her to live in Earth's gravity at least through her teenage years, and which explained Jin Tshei's presence on the *Vesta Explorer*—she was on her way to Earth to visit Vally at her home/school/clinic high in the Swiss Alps.

And why I was now experiencing one of my periodic pangs of passion for the bewitching but unobtainable Jin Tshei.

To cover my almost overwhelming desire to pull her into my arms and squeeze tightly, I concentrated on swirling the cognac around my glass. "The *real* reason I'm going to the Moon, however, has nothing to do with tunnel bonds. It's another one of J. Davis Alexander's brainstorms. This time he's got intimations of mortality."

"Immortality," corrected Jin Tshei, who was the Assistant Curator at the Clarkeville Museum of Art and Human Achievement and the erudite one in our little triad.

"No, *mor*tality. It's just occurred to him that he might actually die one day—and he doesn't want to. He's decided that he wants to live forever. And that if he can do that, then compounding interest will eventually enable him to corner everything in the Belt."

"And after that, I suppose, the entire Solar System," snorted Jin Tshei with ladylike exasperation. "Has he finally lost his grip on reality?"

"Not entirely. Strange as it seems, there's a tiny kernel of rationality in what he's saying. You know about the Moon's MedSys?"

"And their boxies? Sure. But they're not allowed anywhere except on the Moon. Certainly not on Ceres, and I think nowhere else in the Belt either. So if your hairy boss with the sunny disposition wants to corner the

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wealth of the Universe, he's going to have to do it from Kennedygrad or wherever it is you're going. And anyway," she added, pushing her glass into the recycling slot and rising gracefully to her feet, "even the box people don't live forever."

"Maybe, maybe not. You don't hear of any of them dying of old age, do you? But anyway, that's what he wants me to find out about."

Jin Tshei shivered deliciously. "That *awful* man living forever, even inside a box—what a horrid notion! I hope it doesn't give me nightmares."

"If it does, just hop into my bunk and I'll hold you tight."

"I will." She smiled at me fondly. "But nothing more."

I managed an anemic smile of my own. "And nothing more."

Twenty-four days later, right on schedule, the *Vesta Explorer* slipped into orbit 124 kilometers above the Moon. Belt-Earth packets are large and ungainly, designed for interplanetary space, not the gravity wells of even a body as small as Earth's Moon; the .04 gravity of Ceres is the most they can handle without breaking apart. As far as the Moon and Earth were concerned, coming into port was strictly an orbital process. Shuttles awaited to take passengers and cargo down to the surface.

"You're sure you want to come?" I asked Jin Tshei as our line shuffled forward through the packet's loading dock and into the Liberty City shuttle.

"I've got eighteen hours here in orbit before going on to Earth—why not see a little bit of the Moon?"

"I don't know how much sightseeing we can squeeze into eighteen hours but we'll do what we can."

A few minutes later the shuttle eased away from the *Vesta Explorer* and began drifting silently down to the Lunar surface. Jin Tshei and I peered through her porthole as the Sun-baked Sea of Serenity gradually neared. A tiny black dot on the Moon's far horizon grew larger as the shuttle dropped, eventually developed definition, finally revealed itself to be the celebrated three-kilometer-high reproduction of the Statue of Liberty holding her torch over a broad dome: Liberty City, home of 278,000 Loonies and the main Lunar spaceport.

The shuttle came to a barely perceptible touchdown a full kilometer from the edge of the city's dome. Jin Tshei and I kept to our seats as a tractor pulled us rapidly toward the airlock in the wall of the spaceport. Just as our vantage point swung around to where we could see the stupendous statue, looming godlike against the star-studded sky, the airlock swallowed us up and Miss Liberty vanished. Now all we could see above us was the nondescript opacity of the polarized dome protecting us from the deadly morning Sun. Jin Tshei and I pushed ourselves cautiously to our feet in the .17 Lunar gravity. "We made it," I said. "We're on the Moon."

The 180 passengers in the shuttle lurched forward in the clumsy bounces peculiar to the Moon. Jin Tshei and I were among the last to make our way through the ship's broad hatch and into the bright daylight. For a moment I stood blinking. The dome thirty-some meters above

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our heads was opaqued against the Sun's relentless rays but still glowed more brightly than the underground lighting standard throughout the Belt.

"Jonathan?" Jin Tshei was already half a dozen paces ahead of me on the ramp that led from the shuttle to the low concrete buildings that comprised the above-surface portion of the spaceport. On either side of the ramp, heavily laden ground effect machines moved purposefully about the port.

"Be right with y—" I called as, from the corner of my eye, I caught an instant's glimpse of something large and shadowy rocketing toward me.

Then I was slammed violently from my feet and thrown into the air. From somewhere I heard what might have been shrill screams. The last thing I saw before I sailed back through the open hatch was Jin Tshei's long, slim body being crushed against the side of the shuttle's fuselage.

I awoke an indeterminate time later, saw two friendly looking faces peering down at me, and immediately went to sleep again.

The next time I awoke I muttered "Hurts," because it did—all over. Another face drifted nearer, to my drug-numbed mind as if it were suspended in space above me, and a moment later the pain went away.

I slept.

The third time I awoke my head was clear and my vision steady. An unbearably lovely heart-shaped face hovered just above me, great almond eyes looking down into mine. "Jin Tshei," I murmured with infinite relief, "I had the most *horrible* dream! You were being crushed against the side of the shuttle. You—" I broke off, my mind in sudden turmoil. That was *all* I remembered. Why was I lying here? Why was Jin Tshei and everyone else looking down at me so anxiously?

"That was no dream, Jonathan. The stabilizer on one of the port's GEM's suddenly broke. It flipped over on its side and went spinning across the spacefield. You and I are a couple of the lucky ones: forty-seven of the other passengers were killed outright and twenty-six more probably aren't going to make it. You were knocked through the hatch and ended up smacking against the far wall of the cabin. You've got a fine assortment of broken bones but you'll be up and about shortly."

I nodded feebly. "Forty-seven dead: that's awf—Jin Tshei! This *must* be a dream! All I can see of you is your *head!* Where's the *rest* of you?"

Jin Tshei smiled wanly and moved back enough to let me see that her head seemed to be growing out of a soft white ring attached to the surface of a gleaming stainless steel box the size of a medium-sized packing carton.

"This *is* the rest of me, Jonathan. Everything else was crushed. You and Isabel and Valerié-France are just going to have to get used to me like this—I'm now a boxgirl."

By the time I was removed from the various restraining devices in my bed at M'guli Sadartha Memorial Hospital, and inserted into my own little medical ground effect machine, I had almost grown used to the sight of

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boxboy and boxgirl nurses floating in and out of my private room and attending to my needs.

Almost.

But every time I saw Jin Tshei's lovely face with her once-long hair, now cropped to a black stubble, appear by my side attached only to a metal box, my eyes welled up. It wasn't fair! Someone as beautiful and young and wonderful as Jin Tshei *couldn't* be a boxgirl, nothing but a collection of pumps and filtration systems to cycle oxygen and nutrients and blood in and out of her brain.

"How long will you have to . . . stay like that?" I finally had the courage to ask, my eyes focused on the two shiny steel tubes with long, delicate metal fingers at their ends that had replaced Jin Tshei's golden limbs. On the other side of the room a wizen-faced attendant I called Charlie the Boxboy drifted languidly about his housekeeping duties, his sharp brown eyes spending far more time on Jin Tshei's features than on his cleaning and polishing equipment.

"I don't know," sighed Jin Tshei. "I really haven't had the courage to ask. A long time, I think." She managed a melancholy smile. "I do know that you can't just float into Neiman-Printemps and buy yourself a new flesh-and-blood eighteen-year-old body."

"That's for sure," interjected Charlie the Boxboy, giving up all pretense of working and drifting towards Jin Tshei as if drawn by a magnet. "You got some boxies like me who ain't never gonna get one of them fine new newbie bodies, no matter how much they like to tell folks like you that every one of us here is created equal and we're all gonna be a beautiful newbie someday." His thin lips twisted in disgust. "It just ain't *true*. You just wait and see, Miss, it just ain't true." Shaking his head in mournful resignation, he pulled his vacuum cleaner and dusting equipment into the bathroom and shut the door behind him.

"Poor old man," murmured Jin Tshei, staring at the closed door. "I hope I don't turn out like him." She turned back to me with a determined look on her face. "Look, I've been practicing." To illustrate, the box that was now her body drifted away from my bedside and did a series of fancy pirouettes in what little open space my cramped room afforded.

"You're getting pretty good with those compressed air thrusters or whatever it is that keeps you floating," I said, trying to keep a quaver from my voice.

"After the first ten minutes or so it seems to become almost instinctive. Evidently they hardwire the feedback sensors on the thrusters directly to the part of the brain that controls your body's sense of balance. Whatever it is, it works. I just think *higher,* or *lower,* or *left,* or *right,* and that's the way I go." She stretched one of her long, silvery arms towards me and wiggled her intricately articulated fingers almost in my face. "The same with my nice new fingers. *That* took a little longer, but now I can write my name or use chopsticks or—"

"Chopsticks? You can *eat?*"

Jin Tshei's face clouded over. "No. Nothing but packaged nutros—and

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they're loaded directly into my box. The chopsticks are just a training exercise: you'd be surprised how hard it is to use them compared to doing almost any other thing." She sighed. "Once you've mastered chopsticks, you're ready for everything else the Moon has to offer."

I used the fingertip controls on the right side of my bed to push me into a slightly more upright position. My left arm and left leg, which had absorbed most of the impact of my crash landing against the cabin wall, were still tightly immobilized. "Well, I guess we can always put you on the HB&C payroll to give that wretched boss of mine a first-hand report on the Moon's MedSys." I could hear my voice thickening with anger. "If it weren't for him sending me here, this would never have happened! You'd still be—"

"Hush—what's done is done. There's no use blaming anyone. If I'd come down to the Moon by myself, I might have gotten off the shuttle ten seconds sooner and *really* been killed."

Once again thick tears welled up in my eyes. "What about Isabel?" I muttered, finally daring to broach the most delicate subject of all. "Does she know—?"

"Jonathan White? From Ceres?" The door opened and a tall, middle-aged man bounced into the room with the economical hopping motion that instantly told me he was a native Loonie. He was also one of the very few non-box people I'd seen since awakening in M'guli Sadartha. He alighted by the side of my bed and squeezed my relatively good right hand in both of his. "What a terrible, terrible catastrophe! It's only now I've found out where you—" He swung around to face Jin Tshei. "And you must be Mr. White's companion. What a terrible thing to have happened!" He shook his mostly bald head in dismay. "But at least they managed to save you."

"As a boxgirl, yes."

The intruder smiled cheerfully. "It's a start. Believe me—I know!" He gestured broadly with his powerful arms and enormous hands. "Look at *me*. How old would you say *I* am?"

"Before we play guessing games," I snapped irritably, "just who *are* you?"

"Who—oh, I *am* sorry! I thought I'd told you: Tom Van Bastolaer, of Peebles, Van Bastolaer & Mustapha, the lead underwriters for the Kennedygrad tunnel bonds. I'm the fellow who's supposed to be showing you around and answering all of J. Davis Alexander's questions." Once again he pumped my hand between his.

"Oh. But first we have to guess how old you are." I scrutinized Van Bastolaer carefully. He seemed to be a very well-preserved sixty-two or sixty-three, so, out of politeness, I said, "Forty-eight or nine?"

Van Bastolaer flashed a toothy grin. "One hundred and twenty-seven—and I feel like I'm good for another hundred at least!"

I stared at him in astonishment. Finally my brain began to work. "You mean you're one of the—"

"Newbies. Absolutely." Van Bastolaer swung around to where Jin Tshei hovered in midair. "That's what we call ourselves, you know. From *new bodies*. Just like Jonathan here's a gan-

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ic, short for *organic*—we Loonies have had plenty of time to develop our own particular argot."

"And I'm a boxie—or boxgirl. At least it's descriptive."

Tom Van Bastolaer nodded. "But it's how we *all* start out, my dear, even the richest of us immigrants. *Everyone* works as a boxie for three years of public service and then you're eligible for citizenship." Once again he flashed his shiny incisors. "And *then* you're eligible to buy a body. Just like this one."

"Somehow I think I'd prefer a girl's." Jin Tshei had managed a tiny smile. "But I know what you mean—and you're kind to try to cheer me up."

"Wait a minute here," I said, struggling to sit up even straighter. "You mean that's a *real* body you're . . . you're wearing?"

"Flesh and blood?" Van Bastolaer sighed. "I'm afraid we can't have everything. No, no matter how good it looks, it's really nothing more than a very fancy version of the box your lovely friend here is wearing. It's completely inorganic—as opposed to organic, which is why all the human-type Loonies are called ganics. Truth to tell, though, it doesn't work as efficiently as a box in some ways—it's sometimes a lot easier just floating along in your little box than it is bouncing around in a body, even a body as good as this one. But on the other hand, who wants to look in a mirror and see yourself growing out of a box, no matter how handy it is?"

Jin Tshei drifted closer to the underwriter. "Can you *feel* anything in your body? If you can't, then I'd think you might as well just stay in your box—and avoid looking at mirrors."

Tom Van Bastolaer smiled tolerantly, expert to neophyte. "You'll be amazed at how lifelike they've managed to make these things." He pinched his left wrist. "It doesn't feel *exactly* like my old body used to—I don't *think* it does—but at least it feels like *something*. All your bodily sensations are up in your brain anyhow, aren't they? So, as I understand it, all these arms and legs and things on this body are packed with nanochips hardwired to various parts of my brain with all sorts of clever feedback circuits. So when I hit myself on my artificial thumb with a hammer, the appropriate neurons and synapses up in my brain are activated and to me it really feels as if I *had* hit a real flesh and blood thumb." His smile broadened. "Except, of course, my thumbnail doesn't turn black and eventually fall off."

"Hrmph," I muttered, trying to visualize J. Davis Alexander's wolverine-like disposition encased within a virtually unbreakable, immortal body. "And you say this body of yours is 127 years old?"

"No, no—*I'm* 127 standard years old. This particular body's only about forty years old, less actually. I immigrated to the Moon when I was eighty-seven and just about ready for the glue factory on Earth, spent three years as a boxie, and then got this body just after my ninetieth birthday. So it's about thirty-seven years old, I suppose." He patted himself on his broad chest. "Never had a problem with it, no more head colds, no more

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heartburn, no more unexplained aches and pains." He focused his attention on Jin Tshei. "Believe me, my dear, to get one of these bodies, it's *worth* three years as a boxgirl emptying bedpans and cleaning sewers."

"How much does one of these things cost?" I asked.

"A lot—the equivalent of a couple hundred thousand Earth dollars. But once you're a citizen, you can work for anyone who'll hire you—and most of the companies on the Moon'll guarantee your newbie loan. And remember: the body you're buying may be good for a couple of centuries. So what's a couple of hundred thousand against that?"

Jin Tshei's enthusiasm about the joys of boxgirling was considerably more muted than Tom Van Bastolaer's when she next dropped in on me three days later. "Maybe I'll like it better when I've learned all the ins and outs of running this thing and I get something more interesting to do. Right now I'm an assistant junior apprentice water line inspector."

"Sounds important," I grinned as cheerfully as I could from the depths of the GEM chair to which I had graduated earlier in the day. But even in the chair my left limbs were still attached to various therapeutic devices that simultaneously immobilized them and put them through an agonizing series of rehabilitative maneuvers. "What's it actually *mean?*"

"They plug all sorts of sensors and detectors into the power strip in my box, infrared, ultraviolet, vaporometers and stuff like that, stick an oxygen generator over my head, then shove us into the city's water system. And off we go, inspecting every water line we can fit through, millimeter by millimeter."

"Isn't that sort of . . . dangerous?"

Jin Tshei shrugged the best she could considering she had no shoulders. "They say it isn't. But what do *they* care? There's lots more box people ready to go if I get stuck in a crack and drown—and even more oldtimers on Earth just drooling at the notion of getting out of their bodies and into a box." She produced a weary smile. "Actually, there *are* some interesting people among the boxies while they wait to get sorted out. Doctors, scientists, writers, hookers, a little bit of everything. Sooner or later, though, we'll all get classified and reassigned, so that the real doctors and nurses are taking care of people like you."

"And what do former hookers do now that they're in boxes?"

"About what former museum curators do—empty bedpans and inspect sewage lines. But I guess when you consider the alternative, being a boxgirl isn't that bad at all."

"I suppose not." I looked away from her still incomparably lovely face so incongruously growing out of a silver box. "You got the word from Isabel, I suppose?"

We half-looked at each other with hooded eyes for a moment that stretched out longer and longer. Isabel had beeped a long condensed message over the thirty-four minutes of real time that separated us from Ceres. Neither Jin Tshei nor I wanted

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to talk about its contents.

The various Belter governments—the most important ones are Ceres, Pallas, Vesta, Eunomia, and Juno, the five largest asteroid worlds—agree on very few things. One of them, though, is that they don't want any box people or newbies among their citizens. When you die in the Belt, you die, there's no second chance as a sentient box, no matter how useful the contribution the boxboy or boxgirl might make to society.

But Jin Tshei was a Belt citizen, born and raised in Ceres, and although she was now a boxgirl 540 million klicks away, it was through absolutely no initiative of her own. Ceres *had* to allow her to return, to take up her former life as best she could.

Didn't they?

Isabel said no.

As the resource allocations manager of the Clarkeville assessor's office, Isabel knew precisely who actually ran our little world—and where their skeletons were buried. If all the people she'd spent the last ten days wheedling, cajoling, pleading with, and occasionally outright threatening, said that Jin Tshei couldn't come home, then that was that: Jin Tshei could never return to the Belt.

Actually, though, that wasn't quite accurate. From the depths of my bed I had been doing some on-line research in Liberty City's general library. As far as Ceres was concerned, once Jin Tshei's head had been attached to its life-support box, she was no longer a living person, much less a citizen. But dead or alive, in every twelve-month calendar period, she could come to Clarkeville for a three-month stay, just like any other tourist or prospective immigrant. After that, it was either leave or become a citizen.

And she couldn't become a citizen—because she was a boxgirl.

It was a neat catch-22.

Even if she spent three years on the Moon doing socially constructive work as a boxie, accumulating enough money to buy a fine new human-type post-boxie body from Macys-Walmart or whoever sold them, and came to Ceres as a completely human-looking girl, it still wouldn't work: every Cerean citizen has to submit to a routine but thorough annual medical checkup—Psych Service demands that we Cereans all have a sound body in order to maintain our supposedly sound minds.

No, if Jin Tshei ever wanted to return to the Belt, she'd have to find her own unclaimed asteroid, colonize it, and then live there as its sole citizen.

It didn't seem to be a very enticing alternative.

"Yes," said Jin Tshei at last. "I got her message."

Once again our eyes avoided direct contact. We were both thinking the same thing. As long as Ceres Central Registry was not *officially* notified of Jin Tshei's transformation into a boxgirl, she was still legally alive, albeit not physically present on Ceres—and still legally married to Isabel.

If she tried to return to Clarkeville—or if someone tipped off Central Registry as to her present status—then she'd be declared legally dead, her estate would be settled, and her marriage to Isabel would come to an end.

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Which meant that maybe now, given the drastically altered circumstances, Psych Service would relent and let me marry Isabel after all.

Unfortunately Jin Tshei loved Isabel almost more than life itself.

I was glad that I wasn't in her figurative shoes, knowing that in a sense she was totally at the mercy of Jonathan Welbrook White—and precisely how much he lusted to finally possess Isabel exclusively for himself.

I shook my head guiltily, ashamed to be harboring even the faintest suspicion of such thoughts. "Well," I said finally, "it looks as if for once, strange as it seems, all of us are actually on J. Davis Alexander's side. If we can figure out some way to make *him* immortal, as a lousy little byproduct we ought to be able to get you back to Ceres and Isabel."

She nodded. "Let's hope so. But right now I've got to report for work. You may not see me again for a while: I've been assigned to one of the farms on the surface." She wrinkled her nose in distaste. "They need people to clear sludge from the irrigation lines that run from the sewage recycling plants—and I've still got my sense of smell."

"And you're still the most beautiful boxgirl I know. Come and give me a big fat kiss and then we'll try to get our thinking caps on."

Tears were streaming down both our faces as I awkwardly wrapped my one good arm around her box and kissed her tenderly.

In the next few days I learned a number of things from Tom Van Bastolaer of Peebles, Van Bastolaer & Mustapha as he showed me around far more of the Moon than I wanted to see.

The most interesting item, from J. Davis Alexander's point of view, was that even if he bought himself a start on immortality by living on the Moon inside a glossy new artificial body, he *still* wouldn't be able to eventually corner the wealth of first the Belt and then the entire Solar System.

"Believe me," laughed Van Bastolaer when I broached the subject with as much subtlety as I could while we made our way through a hydroponic farm far beneath the Mare Serenitatis where a million brightly colored geraniums stretched as far as the eye could see, "you're not the first person who's been tempted by that vision."

"No? Then why wouldn't it work? Except for the fact that if you had a hundred old-timers all living for a thousand years, you couldn't have *all* of them cornering all the system's wealth."

"Because the LPDA—the Lunar People's Democratic Assembly—in its infinite wisdom long ago made it impossible. After thirty years in a newbie body, or having reached the chronological age of 130 standard Earth years, whichever comes first, all your personal wealth is taxed as if you had actually died. The tax is on a graduated scale so that no matter how much you have, even a couple of billion Lunar Florins, you can't keep more than 4 million LF's—that's about 3 million Belter buckles. After that, they apply the same tax regularly every thirty years. So no matter *how* old you are,

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or how smart you are, you're never going to accumulate more than 4 million LF's—plenty to live on, but hardly enough to corner the Solar System's market in titanium or cornflakes."

"Oh." J. Davis Alexander was not going to be pleased by the news. As we talked in the warm, wet air of the geranium farm, two box people with an assortment of devices attached to their shiny bodies were floating toward us in the narrow lane that ran between the flowers. I lowered my GEM chair by a meter to the same level as Van Bastolaer's head. As the boxies passed overhead, I saw that trailing behind them were containers that sprayed the red and white blossoms on each side of the lane with what I supposed was water and nutrients.

"There's really enough work to do on the Moon to absorb a couple of hundred thousand boxies a year?" I asked skeptically. "There can't be that many flower farms to take care of."

"You'd be surprised how many people want to buy flowers and plants to brighten up their homes when you live 200 meters beneath the surface. But that's the point: we *all* live beneath the surface. And the real estate here on the Moon is free. All you have to do to have your own home is to cut a tunnel and start digging out rooms. Earth considers itself overcrowded with 12 billion people." He waved his arm expansively. "We could take in *50* billion people and never notice them. They'd be scattered all over the Moon's subsurface, some of their housing going down for five or six hundred meters. And we'd *still* be underpopulated!" He tapped me sharply on my right forearm, the one that was now working more or less normally. "Think how many stocks and bonds and mutual funds you could sell to 50 *billion* people! Not to mention all the other goods and services they'd need. I tell you, Jonathan, you're wasting your time out there in the Belt. Come to the Moon, man, that's where all the action is going to be!"

If the Loonies had enough high-speed tunnels to move his hypothetical 50 billion people from one city to another, I thought as we left the geraniums for the next stop on our itinerary, an apartment complex under construction for recently arrived immigrants from Earth. A few meters from the flower farm's entrance, a broad ramp spiraled downward into an enormous atrium carved from the 4-billion-year-old Lunar rock.

"Hydrogen, oxygen, minerals, everything we need's right here in this rock," said Van Bastolaer, pointing at a hundred or so openings that led to new apartments being carved in the wall. "All we have to do is extract them. And with unlimited solar energy up there on the surface—"

"Hey," I interrupted, "I'm a Cerean, remember? *We* live underground, too. Maybe we don't have as much real estate as you Loonies do, but aside from that—"

"Sorry, but I really am enthusiastic about the prospects for the Moon—and for making money from them. Look," he said, "at these new apartments. There're 18,000 immigrants a month arriving. All of them need housing. Construction stocks are hot, Jonathan, a long-term blue chip, a sol-

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id growth industry. You couldn't go wrong with half a dozen of them in your portfolio."

I made a quick note in my wrist recorder of the names of a dozen companies: even if I couldn't bring J. Davis Alexander life everlasting and a corner on the wealth of the Universe, at least I could bring him some tips to mull over.

"All of these 18,000 monthly immigrants are boxies?" I asked.

"Most of them, though we certainly don't refuse those who aren't. But the boxies are *motivated*: either they're so old and feeble that on Earth they're about to die—their bodies are literally giving out—or they're young and crippled or young but with some incurable disease. What's the alternative? A call to the Lunar Consulate, a free ticket to the Moon, a brief stop at one of the MedSys Centers, and they're ready to start life all over again—a life with an *unlimited* future."

"But first they've got to spend three years in a box."

"Damn right." Tom Van Bastolaer smiled grimly. "That's the *other* great advantage of encouraging boxies as immigrants: they work for nothing, or next to it. Their boxes are free except for a little maintenance from time to time, and their nutros and medical costs are hardly anything. And for housing—well, how much housing does a box need? In return, they do all the dirty jobs and gut work no one else wants to do—and they're *glad* to do it. I know damn well that *I* was. And the great thing about it is that the more boxies we have, the more we need in order to take care of the ones who've gone before and have gotten newbie bodies of their own."

"Like you."

"Absolutely. Right now I've got a sixteen-room apartment, two boxgirl housekeepers, a boxboy chef to cook for my human friends, a secretary, and I'm thinking about getting a butler. I tell you, Jonathan, not even a *king* on Earth lives the way I do."

For a long moment I watched the crews of boxies using their industrial lasers as they drilled out one small cubicle after another in the rock face across the atrium. Shops, boutiques, and athletic and entertainment centers had already been installed on the two levels at the bottom of the 100-meter-high atrium. There seemed to be hundreds, maybe thousands of boxies swarming around the construction site.

"You say there're 18,000 or so immigrants a month being turned into boxies?" I said after doing a little mental calculating.

"Right."

"And native Loonies, the ones who're born here, don't have to become boxies, they can just go ahead and buy themselves a newbie anytime they need one?"

"Right again."

"So how come there are 13 or 14 million boxies, or whatever the figure is? If you process 18,000 immigrants a month into boxies, and they stay that way for three years before getting their citizenship, I'd think that the most you could have at any one time would be 648,000."

"I suppose," agreed Tom Van Bastolaer. "But you've got to remember that

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not every boxie is as thrifty and hard-working as he should be. Even a boxie can find ways to spend his money. And keep from working as much as he's supposed to. So a lot of them finish their three-year contracts and don't have the money to buy their citizenship. So they have to stay in their boxes until they do have enough money." He scowled disgustedly at the notion of such shiftless beings.

"What's it cost, Lunar citizenship?"

"An even hundred thousand Lunar Florins, which sounds like a lot. But it can be done if you just work hard enough!"

"I suppose so," I conceded. "I know *I'd* sure have a lot of incentive to get out of one of those boxes. Speaking of which, what about these MedSys Centers? That seems to be the key point in this whole process where broken-down old geezers from Earth are turned into shiny new boxies. If you're talking about 50 billion Loonies someday, making people into boxies has *got* to be a growth industry."

Van Bastolaer grinned. "I was wondering how long it would take you to figure that out. So that's our next stop: the Omer and Michele Darr MedSys Center."

"Oh? Well, it's going to have to wait until after lunch, I'm afraid." I nodded at the new recorder on my right wrist that had replaced the one smashed on my other arm. "I've got an appointment with the radiologist in half an hour to see how my bones are coming along."

"I was listenin', you know," said Charlie the Boxboy as he guided my GEM chair down the corridor, "to what that bigshot newbie was sayin' to you t'other day in your room, Mr. White, and most of it was nothin' but a pack of lies, you know what I mean?" Ahead of us I could see the sign that pointed to X-rays, but Charlie brought us to an obstinate halt in the middle of the corridor.

"What kind of lies?" I asked, apprehensive about anything that might affect Jin Tshei.

Floating just at my eye-level, Charlie squinted at me confidentially. "Well, it ain't so much lies, mebbe, Mr. White, but what he ain't sayin'. And sometimes that's just the same as lyin', ain't it?"

"Absolutely. But for example?"

"Well, like when he says that ever'one what comes to the Moon has gotta work as a boxie and then they can buy themselves a fine new newbie. That's sorta true, but what he ain't tellin' you is that when rich guys like him get off the ship on the Moon and they got the dough to buy themselves their citizenship as soon as their three years are up, then they don't gotta work at just any kind of scut job the Labor Board assigns you to, like shovelin' pig manure and cleanin' out old sewers. They can go do any job they can get—and get paid regular wages for it."

"But they're still boxies, aren't they?"

"Yeah, but they're *free* boxies, if you see what I mean, not like most of the rest of us."

I pursed my lips, trying to work out exactly what Charlie was driving at. "You mean that rich boxies can get

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jobs just as if they were newbies—or real humans? And get paid for it?"

"Hey, *I'm* a real human too, Mr. White, it ain't my fault I'm stuck here in this box!"

"Sorry, Charlie. All of this is confusing for me."

"It's real simple," he said in exasperated tones. "All the boxies you see like me ain't *never* gonna have no newbie bodies. We're gonna work the rest of our lives hauling crap around while the rich guys lord it over us."

"But after three years—"

"After three years, if you can't pay for your citizenship, then you have to take any jobs the Labor Board assigns you to."

"But surely they pay—"

"Yeah, slave wages! Just enough to keep us alive! And then they deduct about a million things from our pay: taxes, housing, nutros, air and water, maintenance and repairs and tune-ups on our boxes, and about a million other things they don't tell you about when they sign you up on Earth for your life in paradise on the Moon. Hell, they even make us pay for usin' our radios that let us talk with the other boxies, and that's about the only pleasure we *do* have. Paradise, ha!" For a moment I was afraid he was actually going to spit on the hospital wall. "I tell you the real truth, Mr. White, the truth is when you're done being a boxie after your first three years, you *owe* more money to the Labor Board than you've saved to buy your citizenship. And you're gonna keep on owing 'em until your box breaks down for good or you just can't take it anymore and you take a floater out through an airlock without your helmet on. It's either that or spendin' the next 500 years as a boxie. And believe me, Mr. White, that ain't nothin' to look forward to!"

"But Mr. Van Bastolaer said that the companies here on the Moon will guarantee the loans to buy your body."

"Yeah, if you're a citizen. But if you ain't, forget it! And if you're a bigshot newbie or a native-born ganic who ain't never got to be a boxie even when he's about ready to croak, what are you gonna do: pay real wages like you would to another ganic, or pay nothin' wages to a boxie you can keep around for fifty or a hundred years doin' the same job for nothin'? You tell me which one you're gonna do, Mr. White. I've earned my citizenship a hundred times over, but I'll never get it, not from *them!*"

With a snort of infinite disgust, Charlie activated my ground-effect chair and propelled me toward my appointment with the radiologist.

Another boxie, I recalled. One who had citizenship and the commensurate salary of a certified radiologist? Or one who, like Charlie, was little more than a feudal serf? And likely to remain that way for an infinitely long lifetime?

What was that line from the ancient song—"You owe your soul to the company store"?

Four hours after my visit to the X-ray lab I knew all I wanted to about how a ninety-one-year-old Shanghai bureaucrat riddled with incurable bone cancer was turned into a shiny

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new boxgirl. If you were a medical doctor or a blood-loving sadist, it was probably fascinating stuff; if you were an ethical broker & bourseman it was merely stomach-churning. "What about all the leftover . . . bodies?" I muttered. "I haven't seen anything in the way of cemeteries."

"We Loonies are not very sentimental, I'm afraid. It all makes very nice fertilizer for the organic farmers. Another blue chip for your portfolio."

I shuddered. "I'll pass that one on to J. Davis Alexander, thank you." I turned away from the sight of two-dozen day-old boxies bouncing their shiny new bodies up and down on tiny bursts of compressed air and scrutinized Van Bastolaer's unabashedly middle-aged face. "You say you're 127?"

"Right."

"And thirty years or so ago your body was thrown away—or turned into fertilizer—and your head was attached to a box for three years."

"Right."

"And then, having earned, or brought with you, enough money to pay for it, you got this fine young newbie body you're still wearing."

"Right again."

"So how come this face I'm looking at doesn't *look* like a 127-year-old face?"

Van Bastolaer laughed. "Simple—very good cosmetic surgery: another growth industry. After that, anti-senescent treatments, including bone regeneration, plus the fact that once the rest of your body's been discarded with all the hormonal imbalances and problems inherent in it, the head itself hardly ages. And separating the brain from the body and nourishing it properly the way you do once you're a boxie eliminates all sorts of mental illnesses and symptoms of traditional old age like forgetfulness and senility. It isn't the head and the brain that grow old, Jonathan, it's all the supporting infrastructure around it. Now then—" Van Bastolaer rubbed his hands together briskly "—let's go take a look at the Liberty City-New Saigon tunnel extension that's under construction. That'll give you a pretty fair idea of the Kennedygrad-Dooley's Downfall one we want to float those bonds for."

Two days later I had become a semi-expert on the construction of nine-meter tubes running as much as eighty-nine kilometers beneath the surface of the Moon. Unlike Earth's interior, that of the Moon was no longer molten, or even particularly warm except at the very center. If you wanted to dig a high-speed tunnel from Kennedygrad to Dooley's Downfall 972 surface klicks away, it was just as easy to excavate a geometrically straight tunnel 883 klicks long that ran directly between the two points as it was to burrow a few dozen meters below the surface while adding 89 klicks to the cost of digging the tunnel.

I had also seen more boxies than I could count toiling at the construction of the Liberty City-New Saigon extension, as well as in manufacturing plants, water and oxygen extraction centers, nickel and titanium mines, potato farms, shrimp and oyster

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hatcheries, waste recycling plants, distribution centers, and schools, hospitals, and crèches—anyplace, in short, where the work was long, tedious, or dangerous.

"All right," I told my indefatigable mentor at last. "If there's anything left to see on the Moon, I don't want to know about it. The medical boxies tell me I'll be out of this GEM chair tomorrow, and the packet back to Ceres leaves in three days. I've already beeped all the info about the bond issue he'll ever need to J. Davis Alexander, so now I've got three days to try to find a way to get Jin Tshei back to Clarkeville with me."

"Speaking of Ms. Jin Tshei," said Van Bastolaer, "that reminds me of one more tip I wanted to give you—I think it could be a real money maker."

"Great, but what's it got to do with Jin Tshei?"

"You told me she'd been assigned to work on the surface for a couple of weeks, didn't you? Let's go up and take a look."

The elevator that took us to the Mare Serenitatis came out right in the center of the patchwork additions of agricultural domes that were gradually spreading out to the east and south of Liberty City. All sorts of agricultural items, it seemed, from blueberries to bok choy to rutabagas, grew better in carefully filtered sunlight than they did in underground hydroponic farms. Either they were plants that didn't mind the fourteen-day Lunar nights that were the inevitable companions of the fourteen-day Lunar days, or they had been genetically restructured to complete their growth cycle during a single two-week-long period of uninterrupted sunlight.

But it was too bad, I thought as my GEM chair hovered above a field of dark green cabbages that stretched for hundreds of meters in every direction in the Hop Chong Long Celestial Napa Cabbage Growers Cooperative, that here on the surface you really couldn't *see* anything. Somewhere to the northwest, I knew, was the 3,000-meter height of the Statue of Liberty, and far to the west, on the other side of the city, the spaceport. But all during the half-month Lunar day the polarized domes of the hundreds of farms were carefully adjusted minute by minute to let through just enough sunlight to ensure maximum growing efficiency. With absolutely no Lunar atmosphere to filter the Sun's intensity, inside a completely transparent dome both humans and plants would quickly be fried to a crisp.

"No, no, *boiled,*" corrected Tom Van Bastolaer from his own GEM chair that he had rented just before taking us to the surface, "or maybe steamed. All the water vapor in this atmosphere would be heated to the boiling point and we'd be cooked like lobsters."

"Like lobsters—you have a *wonderful* way with words." I tried to repress a shudder. I scanned the apparently endless field of napa cabbages, seeing a dozen boxies darting over the plants like strange silver honeybees. "But what's this got to with Jin Tshei and your hot stock tip?"

"Nothing directly to do with her," he said, leading me along a narrow roadway filled with agricultural equip-

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ment toward the edge of the opaque dome. "It's just that she's up here on the surface—and so is this."

We passed through the large airlock that each of the domes used to isolate itself from its neighbor's climatic zones. This new dome was smaller than the cabbage cooperative, and seemed both hotter and drier. A diffused brightness that I supposed had to be the Sun was directly overhead in the otherwise evenly glowing white sky. Half a dozen box people drifted slowly above the farm's crop of tall, shaggy leaves.

"What's all this?" I asked. "Taro or manioc or something weird like that?"

"Even weirder," said Tom Van Bastolaer. "Tobacco."

"Tobacco? But that's a—"

"Poison, sure. On *Earth*. It's been outlawed for over a century now, even in China. But what's the name of this town?" His mouth twisted into a quirky smile. "Liberty City. And we take our liberties seriously. Which means that if someone wants to smoke—"

"But—"

"I know, I know, you're going to say there's a difference between liberty and actively permitting people to commit suicide, which, of course, is what smoking is. *To a human body*. But suppose you don't *have* a human body: you're just a head attached to a life-support system? *Then* what's wrong with smoking?"

"But, but. . . ." My voice trailed off. "There's got to be *something* wrong with it!"

"Really? The pleasure a smoker derives from tobacco is when the nicotine enters his bloodstream and is almost instantly transmitted to the limbic section of his brain, which is where the so-called reward system is."

"Reward system?"

"Where the brain rewards biologically useful behavior such as eating or reproducing, by stimulating the neurotransmitter flows, which makes you feel good. It seems there's a neurotransmitter chemical called glutamate which is what the nicotine actually works on, speeding it up and intensifying its flow. So that's why smoking acts as a stimulant—and makes you feel so good—it's all in the glutamate."

"It sounds like you've studied this."

"A little—as part of my business. And I decided that if you haven't got any lungs to rot, or heart to run down, or stomach to erode, just a titanium bellows to pump the nicotine into what remains of your bloodstream, then what's wrong with smoking as long as you don't do it around non-smokers? Smoke as much as you like—it has absolutely no adverse physical effects on the brain itself."

I stared out at the legendary plants that had been banned everywhere in the Solar System since long before my birth. "So you're growing it here legally."

"It's Liberty City, remember?"

"And there's a company that makes legal cigarettes?"

"Three of them, actually. There're two other fields."

"And places throughout the city where you can legally smoke them."

"Now you've got it: smoking clubs.

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High-powered air filters and scrubbers. Absolutely no one else gets contaminated."

"And nicotine is just about the most addictive substance in the pharmacopeia."

"*The* most addictive. Because the brain's limbic section is constantly telling your body to send it more nicotine. That's the other reason it was banned. Even if you're a boxie or a newbie, once you start smoking it's almost impossible to stop—the hardwiring in your brain doesn't *want* you to stop."

"And someone's making money on this every step of the way?"

"Absolutely. If you're a boxie, or even a newbie, what other vices can you indulge in that make you feel so good? There're about seven different stocks that I think look *extremely* good for long-term growth. Let's go back to my office and I'll—"

That's when sirens began to scream, the sprinkler system came on and had us drenched almost instantly—and the opaqueness of the overhead dome began to fade. Seconds later, even before Van Bastolaer and I had had the sense to begin looking for shelter, we were simultaneously trying to keep from being drowned and from being blinded by the rays of the unshielded Sun.

"Over there!" shouted Van Bastolaer above the banshee wail of the sirens, pointing at a large red shed. "That's where they cure the tobacco!"

We never made it.

Three box people emerged from the artificial rain and came to a halt just above our heads. "There's an emergency!" cried the black male with thick white tufts of hair over his ears. "Everyone's being directed to gather back in the artichoke field!"

Completely mystified, and hoping that none of the domes of Liberty City had been pierced by a meteorite, we let ourselves be led along with what looked like two other ganics through the deluge that was inundating the tobacco farm and back into the cabbage fields. Here, at least, it wasn't raining, and the sirens were mercifully silent. But the Sun blazed down from a jet-black sky through a completely transparent dome. The only thing I could see, except for endless rows of cabbages and the dazzle in front of my eyes, was the distant figure of Miss Liberty rising high above the long, flat dome of Liberty City.

"What do you think is hap—" I was saying to Tom Van Bastolaer when his hand tightened painfully around my arm.

"Look," he muttered in a strangled voice.

Tiny white and yellow flashes seemed to sparkle across the shoulder of Miss Liberty. Then, so slowly that it was hard to believe it was actually happening, the upraised arm that held the torch of liberty began to fall away from the body, followed by the majestic head. Even as they drifted slowly downward in the Moon's light gravity, we saw the entire body tremble, then slowly, slowly topple backward.

It was only when about a hundred and fifty of us, twenty-five ganics, a hundred and twenty-five newbies, and one convalescent Cerean in a

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GEM chair, had been brought together from all the farming domes around Liberty City that we learned what the so-called "emergency" was.

We—and everyone else on the Moon—were now the guests, hostages, or prisoners of the box people.

Take your pick.

"Whatever we are," murmured Tom Van Bastolaer toward the end of our second standard Earth day of captivity, "if we don't get out of here soon we're goners."

I nodded lackadaisically. We were sitting in a makeshift shelter in the middle of the Palermo Family Artichoke Farm and hoping that Van Bastolaer's facetious words two days earlier about being steamed like lobsters were not going to prove prophetic. Half a dozen boxies circled us slowly, construction lasers held menacingly in their mechanical hands.

Our box people captors, of course, at any time at all could have zoomed over to the controls that regulated the opacity of the overhead dome and quickly restored our twelve-hectare sauna bath to its normal temperature and humidity, but they apparently had no intention of doing so.

Instead, they had grudgingly allowed us to use whatever leftover bits of cartons, wrapping paper, and plastic sheeting we could scrounge from the various buildings scattered about the farm to construct a ramshackle roof whose only purpose was to keep the overhead Sun from A.) blinding us, and B.) roasting us.

Now, thanks to the generous amount of water vapor in the air, combined with the fact that the Lunar day still had six standard days to go before the Sun finally set on the far side of the Sea of Serenity, it was getting hotter and hotter.

And still hotter.

By now, all twenty-five ganics, men and women alike, had shucked their clothing and lay nude and corpselike in the shade of our shelter, too weary to move or even complain. All my hospital clothing had been cut away by a helpful newbie and I lay slumped in my GEM chair, naked except for those bandages, casts, pressure molds, and therapeutic devices that were more or less an integral part of me.

As for all the poor newbies who shared our plight, their artificial bodies had their own built-in cooling system and the clothes they wore were purely for decorative purposes. When their systems overheated that would be the end of them—and of their hundred and some-odd-year life spans.

Wearily cursing J. Davis Alexander and his twisted ambitions for all they had done to Jin Tshei and me, I flicked at the continuous stream of sweat rolling off my forehead into my eyes. The one thing you could say for the boxies was that they were giving us plenty of water. That way they were keeping us alive and sweating dramatically for the video cameras that were transmitting our miserable images to the far corners of the Solar System.

We were, apparently, worth more to the boxies as live testimony to the humanitarianism of their demands than as dead proof of their unrelenting determination.

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For the moment.

In the meantime, it kept getting hotter.

"Cheer up," I croaked to Tom Van Bastolaer, "only 139 hours to sunset—at which point we'll freeze to death."

"I'll never again eat a lobster."

"I thought you newbies didn't eat at all."

"I'll never again *think* about eating a lobster."

A boxgirl drifted closer, a gray-haired woman whose high cheekbones might have been of Slavic origin. "Some more water?"

I nodded resignedly. "I'm running out of nutros," muttered Van Bastolaer. "All of us are. We're going to start having irreparable brain damage pretty soon if you don't give us any."

"Sorry, I don't have any. The orders are to give you only water."

"But you box—you people are *crazy!*" protested Van Bastolaer. "I was a boxie myself for three years! I *know* what it's like. All of us newbies do. We're on *your* side!"

"Really? Once you're in your fine new bodies, I don't see any of you newbies standing up in the Peep's Assembly demanding civil rights for us boxies! Or helping us get our own bodies like all you rich bastards got yours."

"But . . . but. . . ." Van Bastolaer shrugged helplessly and fell silent. How *could* he stand up for the civil rights of boxies: he thought they already had plenty of them.

The boxies, apparently, all 13 million of them, or at least a sizeable percentage of them, didn't agree. They felt that being confined to a box and being paid next to nothing to perform all the dirty work on the planet was a clear violation of their basic human rights. They wanted automatic citizenship for all the boxies who had worked six months and they wanted it *now*.

And to get it, they had effectively shut down the Moon.

Toppling the Statue of Liberty had merely been a way of drawing attention to themselves. On a more practical level, they had shut down the world's spaceports, taken over the electrical, water, and oxygenation plants, and closed the doors of the MedSys Centers where daily shiploads of ancient Terrans now anxiously awaited to be transformed into boxies before their feeble bodies gave out on them. But until the box peoples' demands were met, no more boxies were being created who might then be pressed into duty as strike-breaking scabs.

They shut down the tube tunnels between the cities.

They took over the surface farms and exposed the delicate crops to the destructive fury of the naked Sun.

They stopped doing the maintenance and engineering that kept all of the Moon's financial and commercial centers going.

They stopped the building trades.

They turned off every waste disposal and recycling station in the world. They cut the air filtration systems back to the minimum. Garbage piled up; the Moon began to stink.

They detained, or sequestered, or blockaded, as many ganics as they could.

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They stopped cultivating the underground hydroponic farms that accounted for most of the population's basic foodstuffs—and sealed their entrances shut so that no one else could get in to run them.

Human-type people with human-type stomachs began to get hungry. And thirsty, and alternately hot or cold, and terrified, as water and heating and air-conditioning and electricity were cut off at increasingly frequent intervals.

Up on the surface farms it got hotter and hotter.

And still hotter.

"Hi there, Mr. White. How you doin'?"

I looked up with what remained of my energy and rapidly fading curiosity. Hovering in the glare just outside our patch of shade was a boxie who seemed vaguely familiar. It was hard to see his features, though, so completely was his head covered by an enormous broad-brimmed hat. "Oh," I said, finally placing his nasal whine, and feeling the stir of a faint gleam of hope, "it's Charlie the Boxboy. Hey, Charlie, have you come to get me out of here?"

The enormous hat waggled from side to side. "'Fraid not, Mr. White. Just comin' by to say hello. Sorry to see you up here with all these no-good newbies, I thought you was down below with ever'one else."

"I wish I was," I said with total sincerity. "And I wish you were too. How come you're mixed up with these . . . these other guys here?"

"Well, I'll tell you, Mr. White. One of 'em called me the other day on my radio and asked if I'd like to help 'em out and maybe help me get a newbie of my own. So natcherly I says yes. When you spent twenty-eight years inside a box like me, whattya got to lose?"

"Twenty-eight years!"

"You better believe it."

Tom Van Bastolaer, nervously checking his built-in wrist panel that told him how many remaining hours of nutros—and life—remained in his central reservoir, groaned softly. "And all 15 million of you boxie lunatics are floating around trying to kill people? I don't *believe* it!"

Charlie the Boxboy cackled happily. "Hell, no, not by a damned sight! Just a couple thousand of us, but that's all it takes, ain't it?" He cackled again. "It's so simple it makes you wonder why nobody ever thought of it before."

"Thought of what?" demanded Van Bastolaer disgustedly. "Of seeing how many decent people you can kill by boiling them to death?"

"Ain't nobody gonna be killed if you people who *think* you're running the place do a little listening for once to the people who're doin' all the work, and let us share a couple of crumbs from your table." Charlie spoke with surprising dignity. "But what I meant was, Mr. White, was that once the first couple boxies got the idea that maybe we should finally stand up for our rights, all they hadda do was run a database check to see how many of us boxies been stuck in our boxes for fifteen years or more and ain't been able to buy our way out no matter *what* we do. So then they just started callin' us one by one

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until they got enough of us to do what's gotta be done. And ain't none of you fancy newbies and ganics ever got the slightest idea what was goin' on right under your noses!" He cackled again. "Hope you come outta this all right, Mr. White—but then, I hope I come outta this box, too! See you around."

With a jaunty wave of the industrial laser he had politely kept hidden behind the back of his box during our conversation, he soared off into the blinding dazzle.

"So *that's* who's causing all this trouble," muttered Tom Van Bastolaer in unbelieving tones. "Riffraff like that! They *say* they don't have any rights; they're just too damn lazy or stupid to work for them like the rest of us did! I just can't believe it!"

I sighed. If every newbie on the Moon felt the same way Van Bastolaer did, then there was going to be very little meeting of the minds between them and the boxies.

And I was going to keep getting hotter and hotter.

"What about soldiers or the police?" I ventured tentatively. "Couldn't they—"

"We don't *have* soldiers on the Moon—what would we need them for? And most of the police are boxies themselves. Who wants to be a cop? And anyway, how do you arrest or shoot a bunch of boxies who don't *want* to be shot? All they have to do is to disappear into the nearest air-conditioning duct or water main. You'd *never* find them all! And if you tried to shoot them, they'd start turning off the water and electricity—for *good.*"

I brushed more sweat away from my eyes. "Then what do you think is going to happen?"

"I think we either give in to their demands—or there are going to be an awful lot of dead humans and newbies."

It continued to get hotter.

"Well," I said, knowing that this might be the last conversation I'd ever have, "I guess this takes care of the tunnel bond funding. No one in the Belt is going to want to put their buckles into a place where a bunch of animated boxes can take over the tunnels and blow them all up if they aren't given an extra helping of caviar for lunch."

There was no reply from Tom Van Bastolaer. His eyes were closed, his mouth was open, and his breathing was ragged. He looked barely alive. Without moving my head I glanced around at the other bodies of both organic humans and newbies sprawled in the ovenlike heat. How many of *them,* I wondered vaguely, were already dead?

Was it worth trying to make a last desperate dash in my GEM chair for one of the airlocks or elevators that had supposedly been sealed by the boxies and trying to fight my way through?

I was still turning this over sluggishly in my numbed mind when I became aware that the blinding glare outside our darkened shelter was becoming rapidly less bright. Was it me—my body finally shutting down forever—or was it really growing darker inside the dome?

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Moments later, the section of dome that I could see from where I huddled, turned a polished silver, then vanished completely in the utter darkness that suddenly engulfed us. Once again sirens howled and cool, cool water splashed against my body, first in droplets, then, in spite of the makeshift overhead shelter, in torrents. An icy wind appeared from nowhere, chilling my overheated body instantly. Moans and muffled shouts of bewilderment from my fellow prisoners could be dimly heard over the wailing sirens.

Now there were shouts of alarm and surprise—from our box people captors. *They* didn't know what was going on any more than I did.

As taut as a fully drawn bow, I sat in the darkness, wondering what to do now.

Some of the floating boxie guards switched on their built-in lighting units and began to flicker about the rain-filled dome like dimly seen fireflies.

A hand gripped my shoulder.

I probably jumped no more than two and a half meters.

"Quick!" hissed Jin Tshei's voice in my ear. "Get your chair onto my pallet! I've got all the entrances jammed open. We'll—"

"Van Bastolaer," I gasped. "He's dying. We've got to. . . ." I trailed off, too busy trying to use my GEM chair and my one good arm to drag the Loonie's limp body onto the dimly outlined platform Jin Tshei had maneuvered next to us.

"Hey! What's going—" A boxie appeared out of the darkness and loomed beside me, a tightly focused beam of white light stabbing down on Van Bastolaer's chest.

I caught a brief flash of a silvery gleam and heard a meaty thud. The boxie went cartwheeling away, his light turning end over end until it vanished in the rain.

"Let's *go!*" screamed Jin Tshei, brandishing the steel bar with which she had just bashed the guard. "Your friend's on the sled! We've got to get *out* of here!"

The pallet lurched beneath me and we plunged into what seemed to be a torrent of water as dense as Niagara Falls. Moments before, I had been worried about boiling to death; now my only concern was to keep from drowning.

"How can you see where we're going?" I shouted around mouthfuls of water.

"Infrared goggles," came the barely audible reply. "I'm going strictly by heat source."

Whatever Jin Tshei was doing, it was working. Almost before she had finished speaking, we were abruptly out of the rain, although the wail of the sirens was even more deafening and the darkness seemed even more absolute.

Suddenly my stomach seemed to be floating up around my ears. "Elevator!" shouted Jin Tshei above the siren. "We're going down!"

By the time we emerged into a dimly lighted passage of roughly dressed rock walls, the sirens were only barely audible. Two sharp turns and a steep ramp brought the four-meter-long pallet and its improbable cargo to an im-

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posing metal door hung with KEEP OUT and DANGER signs and stylized death's heads.

"In here," breathed Jin Tshei into the eerie silence that now seemed to be filled with the noisy beating of my heart. "Quick!" The door slid open.

In here was a rectangular cubicle whose walls were brightly colored scenes of bucolic spots on Earth. The ceiling was a creamy blue and white and its thick carpet a cheerful yellow and orange. Comfortable-looking chairs and couches jammed all the available floor space. Dozens of unfamiliar glass and ceramic objects were scattered throughout.

"Ashtrays," explained Jin Tshei as she caught my look of puzzlement. "This is an old smoking club that's been replaced by a bigger one down the hall. I found the program that changes the locks. Now no one can get in except me—and you." Floating in the middle of the room, she used the metal pipe that she had used to whack the boxie to indicate a jumble of items piled high on one of the leather couches. "You've got all sorts of emergency breathing equipment and lights, tanks of compressed air, everything I could get my hands on. And just in case the crazies really turn the air off, there's a monitoring device that'll warn you if they do. Plus food and water and entertainment stuff. And nutros for newbies—I didn't know whether Van Bastolaer would be with you or not."

As she spoke, she had drifted lower to slip an oxygen mask over the Loonie's face and to pull his drenched shirt away from his torso. A plate in his formidably muscled male chest opened and Jin Tshei began pulling empty nutrient packets from the cavity and replacing them from a carton on the couch. "There," she said eventually. "I'm not much of an expert in newbie maintenance but it's amazing how much information you can access from one of these boxes." She snapped Van Bastolaer's chest shut and together we tugged his body off the hovering pallet and onto a couch. "Either he'll live or he won't." She rose decisively into the air. "I'll let you know when it's safe to come out. In the meantime, don't open the door for *anyone*—they'd have to use industrial lasers to burn their way in."

"Who'd want to burn their way into a cancer factory?" I asked groggily, still half-dazed by the suddenness of recent events.

"No one—I hope."

"But what are we *doing* here?"

Jin Tshei smiled wanly. "Haven't you guessed? Waiting out the revolution."

"But what about *you?* Aren't you staying with—"

She grinned broadly. "I can't—I'm a revolutionary myself, only a simple foot soldier, but still a soldier. That's how I learned all the programming tricks to cause all that confusion upstairs."

"You, a revolutionary? You've only been here a couple of weeks!"

"How else was I going to save you?" She drifted closer and her lips brushed mine. "Don't go out, no matter how boring it gets." She floated toward the door. "One thing I *didn't* leave for you—cigarettes. I want to

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find you alive when I come back."

For the rest of the Glorious Revolution of 2283 Tom Van Bastolaer and I played chess and monopoly and cornered the Solar System's entire wealth on various computer games that Jin Tshei had left us. But as revolutions go, it wasn't a very long one, hardly more than an extended coup d'état. Three times the lights went off, six times the water, and once—for a heart-pounding twenty seconds—the entire air system. It wasn't long after *that* that the door slid open and Jin Tshei's gleaming box darted into the room. Six and a half standard days had passed since it had closed behind her.

"It's over!" she exclaimed.

I looked up distractedly from where I was about to capture Van Bastolaer's queen. "Who won?"

"The boxies, of course." She floated down beside us, settling her box body on the couch. "How could they lose, when you think about it?"

"I concede," said Van Bastolaer grumpily, then turned his gaze to Jin Tshei. "So the inmates have taken over the asylum?"

"Not entirely. We could have held out for more, I think, but we were in a hurry. We now get automatic citizenship eighteen months after we're boxed, and long-term, low-interest government loans for the automatic purchase of a newbie body at the end of the work period."

"Well, there goes whatever industrial productivity we ever had on the Moon." Tom Van Bastolaer sighed heavily. "The stock market'll be *ruined!* And how many people died to achieve this . . . this descent into madness?"

"Too many," said Jin Tshei with a pained grimace. "Hundreds probably, but at least it's not thousands."

"And the hospitals are working again?" I asked breathlessly.

"They will be by the time you get there."

"I must be healed by now! I'm going *crazy* tied to this chair!"

Jin Tshei grinned. "I'll swap you the chair for this box."

I bit my lip. "Sorry, I shouldn't be complaining, I suppose. What about Isabel—she must be absolutely frantic by now."

"I beeped her a message with all the news a little while ago; she ought to be getting it just about now."

"What did you say?"

"That all was well. That we loved her. That you'd be home soon."

I swallowed. "Just me? Not you?"

"Dear Jonathan." Jin Tshei drifted closer, took my good hand in her curiously soft artificial fingers. "There's no magic wand to enable me to return to the Belt. Just wishing it won't make it so. I'm going to have to stay here—and *work* for it."

"Work? How do you mean?"

"Now that we're finally organized, we boxies are going to have to make our peace with the newbies and present a united front—after all, they're as much us as a butterfly is a caterpillar, aren't they? We *have* to be united. And why should we be segregated here on the Moon as if we were typhoid carriers? One of these days we're going to burst out—back to Earth and out to the Belt. Between us, we've got lots of money and some of

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the smartest, most experienced brains in the Solar System. Pretty soon I think you're going to see people on Ceres agitating for full human rights for *everyone,* no matter *what* they look like or what they're made of."

"You mean a PR campaign?"

"Of course. Lobbying, advertising, articles, shows, out-and-out propaganda, some of it very subtle, almost subliminal conditioning, some of it very loud and obvious, teams of visiting boxies and newbies coming to show that we're really not so inhuman as we've been made out to be. Syndicated TV series with boxie heroes and heroines, novels and games with heroic newbies. Anything that money and cleverness can do—we'll do."

"But that won't bring *you* back!" I protested, my voice cracking.

She squeezed my hand. "Eventually it will. Not in this box, maybe, but in *some* sort of body. First as a visitor, then someday as a full-fledged citizen again. I promise, Jonathan: I'll be back. Tell Isabel I love her."

I threw my arm around Jin Tshei's beautiful head and wept.

That was some time ago.

Hartman, Bemis & Choupette successfully underwrote the Kennedy-grad-Dooley's Downfall tube tunnel 5-3/4 percent non-callable bonds of 2314 at 1-1/2 over par and pocketed 27 million Belter buckles for its efforts—some of which even dribbled down to Jonathan Welbrook White.

Isabel and I now spend a lot more time together that we used to, but she still speaks tenderly and longingly of Jin Tshei. So maybe Psych Service is smarter than either of us gave them credit for being.

Valerié-France is doing well at her school/clinic/home in Switzerland and is delighted to receive far more frequent visits from one of her mommies than she ever used to. She also enjoys tremendous prestige among the other children for being the only person there whose mother is a beautiful head on a shiny steel box.

Jin Tshei is still attached to her box although she could have moved to a newbie body some months ago. She is one of seven box people elected to the LPDA and says she intends to remain in her box until she and everyone else like her enjoy full civil rights throughout the Solar System.

On her first trip to Earth to visit Vally, Jin Tshei was forced to smuggle herself in hidden among a shipment of mutated Lunar eagles. Two days later she proclaimed her true status at a widely televised happening in front of the Palace of Human Rights in Geneva. It was six weeks before the authorities managed to get her deported, and since then she—and other boxies and newbies—have been visiting Earth with ever-increasing ease.

Isabel and I hope that her campaign promise to remain in her box and fight for boxie rights is just as binding as any other politician's campaign promise and that on our next get-together, either here or on the Moon, she'll greet us from a newbie body, looking as much like the old Jin Tshei as possible.

"I do love her," declared Isabel, "but how can I hug a *box?*"

J. Davis Alexander has surreptitious-

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ly spent a large portion of the fortune he made with the tunnel bond issue financing the activities of half a dozen recently formed Belter groups working for full implementation of human rights for *all* humans. Not through altruism—but because he still has dreams of immortality in a fine new body as long and lean as that of his gorgeous wife—and of eventually cornering the market on everything in the Solar System.

And me?

I'm not so certain as Jin Tshei and J. Davis Alexander are about the endless virtues of semi-eternal life in the form of either boxies or newbies. A couple of demographic projections I've seen by the sort of people who study this stuff prove pretty convincingly that if you turn almost everyone into a newbie, eventually the inorganic people are going to far outnumber the organic ones. And then maybe they'll start asking themselves just why they need all these messy ganics around. After all, *their* bodies are good for at least a couple of thousand years. . . .

But, of course, by the time *that* comes about, the only way I'd be around to worry about it would be as a boxie or newbie myself. Which would probably give me an entirely different perspective on the matter.

And as Isabel says—after coming back from a three-week visit to the Moon and Jin Tshei—it would be easy enough for Psych Service, or any other of the Belt governments, to add a rider to their marriage and reproduction licenses.

To wit: if you want to have children, you have to formally give up any future claim for trading in your aging organic body for that of a boxie or a newbie.

In other words, you can either live forever through your children and *their* children, or you can live forever in an artificial body—but you can't do both.

It'll be interesting to see how things work out.

I also bought as much stock as I could in Lunar tobacco producers and cigarette manufacturers. So far, because of a sharply increased rate of immigration of boxies from Earth to the Moon, the stocks are up 217 percent.

And I've unofficially been helping the Lunar government establish their first consulate office here in Clarkeville.

After all, even we Belters grow old and die someday.

Except when we can get a free ticket to the Moon and a shiny new box. . . .

Jin Tshei: Hurry home—we miss you! ■

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Katherine MacLean

Kiss me

Do two improbables make a possible?

DENNY'S NEW GIRLFRIEND, LAURY, was not interested in science; she was busy studying computer applications to business, but she was pretty and she hung around his laboratory most of her free time and happily listened to him explain what he was doing.

This time his laboratory was full of frogs.

"This bunch is from South Africa, and this bunch in the plastic crate," he pointed, "they are from Kenya." He moved his skinny self over to a big damp glass box. "These are from a lake in Georgia, where they fell into a fishing boat. Usually people only send in frog falls when they come down in dry territory or on city sidewalks, come down like rain. Maybe they come down over lakes too, but on a lake, they could have jumped into the boat from the water. So I don't trust this batch."

Illustration by Anthony Bari

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Laury stared solemnly at each one, trying to see some exciting difference. All the frogs were dark brown, or green with spots, or a pinkish tan, and they all had big yellow-gold eyes. "Beebeeb," said a big one.

"But they all look normal!" she was disappointed. "They don't look strange at all." She picked the biggest tan one from his glass box and kissed it, but nothing about it changed. It stared at her and puffed its throat in and out, "Reebeeb."

She put it back. "Reebeeb," she said back.

Denny was eager to explain. "That's what's strange about them, there aren't any tree frogs or desert toads or poison frogs or any of the interesting ones, the frogs people send in from frog falls are always the same three kinds, no matter where they are from."

"Where did you get all these frogs?" She tapped on the side of the glass box. Most of them jumped away from her finger into the water, and some jumped toward her finger and bumped their noses on the glass.

"Ouch," she said sympathetically to the ones who had bumped their noses. "That must have hurt."

Denny was pleased by her interest. "The whole collection—" he waved at the room full of glass-faced boxes full of frogs, "was turned over to me by the Charles Fort Foundation. People are always sending them frogs from sidewalks and city roofs. They are funding me for a research project on the frogs that come down in frog falls."

"Funding you?" She looked at him with admiration. Scientists seemed to have a talent for generating money for their most kooky projects. "What do they want you to do?"

"Just study their genes. I put it to the university gene fingerprinter machine. So far just normal *Rana pipens* and such. No lead there." He leaned warmly against her shoulder to point. "That bunch is from a desert in Arizona. Look at the date on the label. They were just sent in this week."

Laury was baffled. "Arizona? Frogs don't grow in deserts, do they? They grow in water."

Denny was excited. "They didn't grow in the desert. They rained out of the sky. A rain of frogs. The bible has something about rains of frogs in Egypt. But when it happens in a desert, ten or twenty miles from the nearest puddle, people really notice it and save some frogs to look at. Then I have a chance to get samples."

She was indignant. "You think I'll believe frogs fall out of the sky? You're putting me on. How did they get into the sky?"

"Here, read this," He shoved a big

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book into her hands. "It's a collection of reports about frogs raining from the sky." Dennis pointed at a photograph of a wrinkled-looking toad. "Ask me where that toad came from."

Obediently she asked, "Where did it come from?" She calculated the chances of making a tourist business about frog falls. Could Denny predict them?

"It was found inside a lump of coal. That means it's a billion years old or so. Maybe all frogs and toads came from rains of frogs. Maybe rains of frogs started life on land, instead of lungfish. Frogs are a billion years old."

She looked at the big one she had kissed. "They don't look that old." She thought of putting a million-year-old frog on display. Would anyone pay admission?

He took a deep breath to control his temper and looked at her figure for consolation. "I don't mean these frogs. I mean the ancestors of all frogs. And maybe we are descended from them too. My theory is that some alien space satellite was set in orbit to seed Earth with life, and it has been cloning frog eggs and raising pollywogs, and launching frogs down on us ever since Earth cooled and the oceans condensed. I'm sure that when I map all the frog falls and their dates they're going to show an orbit line around the Earth. With that for a clue I can get an observatory to locate the alien satellite in orbit around Earth and get it on camera launching frogs." He spun around in glee. "Ha! On CNN and the cover of *Science*!"

"Why would aliens launch frogs at us?" Laury asked. "Is it an invasion?"

"Calm down, Laury. Frogs aren't going to hurt us. They never have. They're too small. All they do is hop around, swim, lay eggs and eat bugs. They don't live long enough to become civilized and start wars." Denny started a round of throwing little white worms into the glass boxes. The frogs' tongues shot out and yanked the worms into their mouths so suddenly the insects seemed to vanish.

"Some of these are adult males. The green ones that say Peeeep and the big ones that say Reebeeb and Beebeeb are singing to attract females. They mature to be adults in one year."

Laury nodded, "That's their real problem, too much sex at an early age, retards growth, distracts from learning."

The big tan one in the glass case said, "Reebeeb reebeeb," in a deep musical voice, still staring at her.

"You shouldn't have kissed him," Denny said, "Kiss me instead."

"You never know about superstitions until you try them. He didn't turn into a prince," said Laury. "But if he's only a year old he'd make a pretty small prince anyhow, still in diapers, so it's a good thing it didn't work."

"But he's an adult." Denny moved closer. "I'm an adult too. I'm a consenting adult. Kiss me. Maybe I'll turn into a prince."

"Maybe you'll turn into a frog." She kissed him but his green baseball cap got in the way. He spun the visor to the back, crossed his legs, and tried again.

The big frog sang "Reeebeeb reeebeeb!" and hopped at them, butting

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his nose against the glass.

"He's not very smart," said Laury. "No kind of invader from a spaceship can conquer anything being so small and dumb. Maybe they were sent down to be invaders from outer space, but Earth is too sexy for them and they become adults instead of growing up."

"If you put thyroid into the water of the pollywogs they turn to their adult shape when they are really tiny. The tiny females can even lay eggs." Denny said absently, watching Laury.

"That's not the kind of growing up I meant. That's the opposite. I mean—what can you give them to keep them from getting sexy so they can keep on growing and get bigger?"

"Oh." Denny looked at the big pink one. He went to medical reference on his computer and let it search Retarded Growth, Premature Maturity, and Dwarfism, and sat down to read it on screen. "It says it's pituitary hormone, low pituitary hormone," he said. "I can expose some of them to pituitary hormone to increase growth and retard maturity. I'll write it up as another project and they'll grant me more money. Grantsmanship. Do you know that frogs have more DNA than humans? I could claim it means that they have more shapes available, not just tadpole and frog."

He stayed up reading and typing and did not take Laury on a date that night, or the next night, or any time the next two weeks. She grew angry and when she graduated with her MBA she volunteered for the Peace Corps and went off to balance books for a community improvement incorporation in Mexico. It was easy. She had free time to find a beach and let the students try to teach her wind surfing.

In a hotel bar on a beautiful beach she met a handsome man who owned the hotel. She moved into the hotel for a few years, remaining after the Peace Corps job was over, balancing his books and enjoying water sports in the day, and dancing and lovemaking with the handsome man at night. Her hair sunbleached a brighter blonde and her tan grew darker.

When the handsome man married a girl who had been chosen by his mother, Laury accepted his apology with an inscrutable smile, packed, wiped out all the hotel's financial records from the computer and shredded all the paper records, and caught a plane back to California.

She found out that Denny had been given another doctorate on his frog research and now had a bigger laboratory and some employees, and best of all he was still unmarried. She arrived at Denny's laboratory sure she looked more beautiful than ever.

"Honey, I'm back from Mexico," she called out to the back of a man in a green cap wearing Denny's favorite T-shirt.

The man turned and stood up tall. His face was shiny tan and very wide, his eyes were bright gold and very big, and his mouth stretched almost from ear to ear.

He was surprisingly attractive.

"I've never forgotten you," he said in a deep musical voice. "Kiss me again." ■

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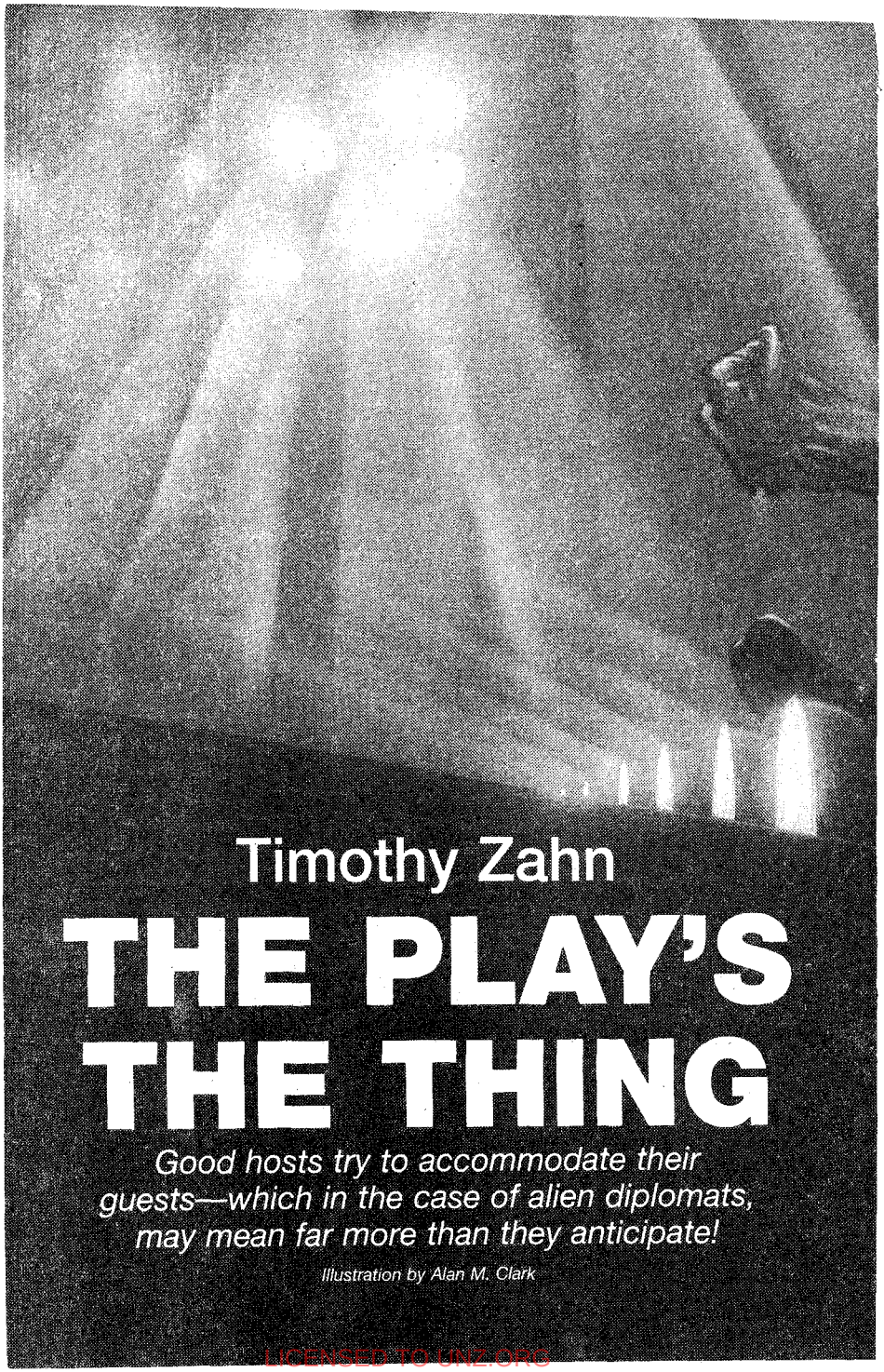

Timothy Zahn

THE PLAY'S THE THING

Good hosts try to accommodate their guests—which in the case of alien diplomats, may mean far more than they anticipate!

Illustration by Alan M. Clark

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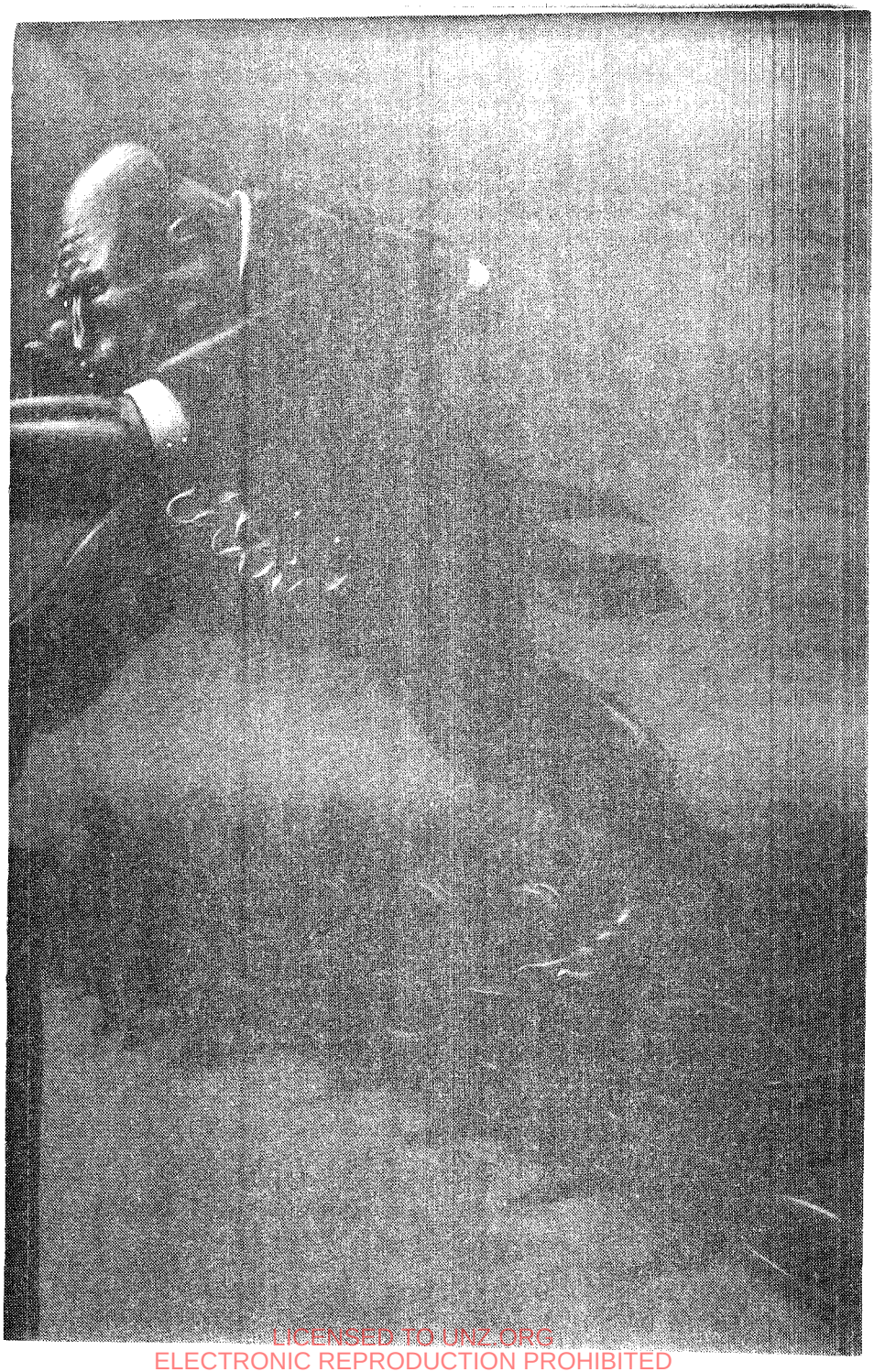

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The whole trouble started when the Fuzhtian ambassador announced that he wanted to see a Broadway play.

Though I suppose you could equally well say that the trouble started when those first silent Fuzhtian probes snuggled coyly up behind our geosynchronous TV satellites and began shipping the signals back home. You might even go back further and say that it all started when Marconi's first radio went on-line and began spewing electromagnetic radiation out into space for everyone to hear.

Oh, well, hell, let's be honest. All of it *really* started with whoever the bunch of trouble-making Sumerians were who sat around on a rainy Sunday afternoon and invented *entertainment.*

Because that's *really* what started the trouble: our vast entertainment industry, and the Fuzhties' maniacal love for it.

For a simple example—and this isn't supposed to be noised about—when the Fuzhtian ship landed outside the White House, the "Greetings and Joy to Humankind" line that will be going into the history books were actually the ambassador's *second* words to the President. His *first* words were an expression of disappointment from his government that Johnny Carson was no longer hosting the *Tonight Show.* For those of you who'd always wondered why Carson suddenly came out of retirement right after that to do a one-month stint as guest-host, now you know.

I suppose it could have been worse. No, strike that—it could have been a *lot* worse. You've heard all the similes: a walking barn door with gorilla arms, a four-hundred-pound bag of blubbery muscle with pinfeathers; a cross between a bull and Doberman on steroids. Even without the kind of technology we knew they had, the Fuzhties could have stomped the planet flat as Florida if they'd taken a mind to do so.

Which is why everyone had been falling all over themselves trying to satisfy the ambassador's slightest whim. Partly it was residual fear that he might suddenly stop being congenial and start behaving the way any self-respecting B-movie creature his size ought to; but mainly it was because every national leader on the planet was visibly salivating over the prospect of getting their hands on Fuzhtian technology.

Anyway, at the time the ambassador made his Broadway request he'd been on Earth about six months, getting everything he wanted. And I mean *everything.* He had the top two floors of an exclusive Washington hotel, specially commissioned airplanes and cars, and three of the premier chefs in Europe. Along the way he'd also collected an astonishingly eclectic entourage, consisting of top US government officials, a smattering of foreign representatives whose countries had somehow caught his interest—we still don't know how or why he picked the ones he did—and a few oddballs like me. I'd been up on a ladder doing some woodwork repair in the White House when the ambassador apparently expressed some sort of vague approval of me. The next thing

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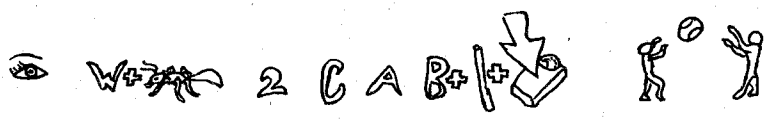
I knew I'd been hauled down, poured into a suit and handed a briefcase, and tossed in among the smiling State Department wonks whose job it was to dog the ambassador's size-28 footsteps.

Long afterward I learned that what had captured the ambassador's attention was not me but rather the hammer I'd been using. But by then I'd overheard enough under-the-breath comments about my relative usefulness to the group that sheer native orneriness required me to keep quiet about the error.

Besides, the briefcase they'd handed me that first day had contained a presidential plea for my cooperation and about two bucketfuls of money, both of which I was far too patriotic to walk away from.

But for whatever reason, I was in that elite group. And I'd been with them for about five weeks when, from out of the blue, the ambassador made his request.

We still don't know what prompted him to bring it up at that particular time. For that matter, we're not even sure how he knew about Broadway, unless he'd picked up a reference from one of those pirate transmissions their probes had been making. But however it happened, there it was, plain as day, that morning on the RebuScope:



"Are you *sure* that's what it means?" Dwight Fogerty, a senior State Department wonk and head of our little group, asked as he peered back and forth between the RebuScope and the tentative translation.

"I don't see what else it could be, sir," chief translator Angus MacLeod said. He'd been loaned to us by MI6 because he was both a whiz at cryptanalysis and a huge "Concentration" fan. Angus always called Fogerty "sir" because he was polite, not because Fogerty deserved it. "It's clearly 'eye w-ant two cee a br-rod-weigh' something. What else but play?"

"Well, who says that scale thing is 'weigh'?" Fogerty countered. "Maybe it's 'Broadscale' something."

"There's no such word as Broadscale," someone pointed out. "Or place, either."

"There's a Broad Sound, though," someone else said, punching keys on a laptop. "It's near Rockhampton in Australia, near the Great Barrier Reef. Maybe that's a radio or stereo speaker, not a scale."

"And what, that last picture is us and him throwing a beach ball back and forth?" Fogerty scoffed.

"Well, then, maybe it's supposed to be 'Broadsword,'" one of the other wonks said. "The damn RebuScope's screwed up before. Maybe he wants to

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see some sword demos from one of those Medieval-nutcake groups."

"It's 'I want to see a Broadway play,'" Angus said firmly. "I'm sure of it."

Fogerty muttered something vicious-sounding under his breath. Why the ambassador had chosen to use a gadget as ridiculously hard to understand as the ReBuScope for his messages to us was a mystery, but most of us had gradually developed a sort of resigned acceptance for the procedure. Fogerty, who dealt with the gadget more than anyone except Angus, roundly hated the thing, and seemed to be running systematically through his vast repertoire of multilingual curses in regards to it. "All right, fine," he said. "We'll take him to a Broadway play. Smith, get on the horn and find out who the hell we talk to about doing that."

I cleared my throat. "You don't need to call the White House, Mr. Fogerty," I said. "I know some people on Broadway."

"We're not interested in pretzel vendors, thank you," Fogerty said tartly, gesturing at Smith. "We need a producer or theater manager or—"

"I know all of them."

Fogerty stopped, his gesturing hand still poised in midair, and turned his head to look at me. "You what?" he asked.

"I know all of them," I repeated. "Up until a year ago I was working with one of the top set designers on Broadway."

It was, and I'll admit it, an immensely soul-satisfying moment. The whole bunch of them just stood there, professionals and wonks alike, staring at me like something that had just crawled out of the primordial ooze and asked whether the Metro Blue line stopped here. All except Angus, that is, who had a faint but very knowing smile on his face. Obviously, he was the only one of them who'd bothered to read the FBI's rundown on me after I was booted aboard.

Fogerty recovered first, in typical Fogerty fashion. "Well, don't just stand there, Lebowitz," he said, waving Smith forward with his phone. "Let's get to it."

The first step, I decided, would be to figure out which Broadway offering would be the best one to take the ambassador to see. I put in a call to Tony Capello, theater critic, and we spent fifteen minutes discussing the current crop of plays and musicals in town.

Actually, the first twelve of those minutes were spent talking over the old times when I was a lowly carpenter and Tony was chief gopher for a succession of minor choreographers. I would have cut off the reminiscences earlier, except that the delay so obviously irritated Fogerty. When I finally got Tony down to business, his advice was instant and unequivocal: "*And Whirrred When It Stood Still,*" currently in previews at the St. James.

"So what's the play about?" Fogerty asked when I relayed the recommendation.

"According to Tony, it's pleasantly harmless froth," I assured him. "Nothing that'll confuse the ambassador or put human beings in a bad light. At least, not in any worse light than plays typically do."

"Assuming he understands it at all," Fogerty growled, gesturing to his over-

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worked secretary. "Lee, better have someone vet it anyway, just to be on the safe side. All right, what about this St. James Theater? It's on Broadway?"

"Well, actually, it's on West 44th Street," I said. "But it's—"

"West 44th Street?" Fogerty echoed. "He wants a *Broadway* play."

"It *is* a Broadway play," I told him stiffly. "The St. James is in the theater district, half a block off Broadway itself. It counts. Trust me."

He glowered, but apparently decided he'd shown enough ignorance for one conversation. "Fine," he grunted. "Let's just hope it counts with the ambassador."

The manager at the St. James, Jerry Zachs, was less than enthusiastic about the whole thing. "You must be joking," he said, looking back and forth between Fogerty and me. "Bring that behemoth into my theater? Who's going to pay for the fifty seats it's going to cost me?"

"Oh, do try not to go off the deep end here, Mr. Zachs," Fogerty said, his voice hovering between imperious and condescending. "We won't have to remove more than nine seats at the most to fit him in."

"Sure—to fit *him* in," Jerry shot back. "What about these seats in front of him you want left empty?"

"That's only another twelve seats," Fogerty told him. "Four rows by three seats—"

"I can multiply, thank you," Jerry growled. "I can also multiply by ticket prices and see I'm already out about a grand and a half. *And* what about all the seats right behind him where no one's going to be able to see? Huh?"

Fogerty shrugged. "Fine. We'll put his entourage there."

"At full price?"

Fogerty lifted his eyebrows. "Don't be silly. They won't be able to see the show from there. How do you expect to charge full price?"

Jerry's complexion was edging into a soft pink, which from my experience with him was a dangerous sign. "I'm sure we can work something out," I jumped in before he could say anything. Fogerty had a virtually unlimited budget to work with, but he could go all chintzy at the oddest moments. "What's important is that the ambassador be treated like the VIP he is."

"That's right," Fogerty said, apparently believing I was on his side here. "The Fuzhties have a great deal to offer humanity, Mr. Zachs, and the more favors he owes us, the sooner he'll start coming across with some of this magic technology of theirs. This is just one of those favors."

"'The play's the thing,'" I said in my best soliloquy voice, "'Wherein I'll catch the conscience of the king.'"

Fogerty frowned at me. "What?"

"*Hamlet,*" I said.

"Shakespeare," Jerry added acidly. "He's done some plays and poems and stuff."

"Thank you," Fogerty said, matching Jerry's acid pH for pH. "I *have* heard of

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the man. The point is that I can requisition your theater, no questions asked, like it or lump it. So you might as well like it. Anyway, you should be honored to have their first ambassador in your theater."

"Besides, think of the great publicity," I reminded him. "You'll be able to use photos of the ambassador in all your future ads and—"

"Wait a minute," Fogerty cut me off, his face suddenly stricken. "He can't use the ambassador as a cheap come-on. This is a serious diplomatic mission."

"Oh, I don't know," Jerry mused, picking up the cue and running with it. "When the King of Sweden came here, he let us use his name in some of our promotionals. I don't see how this is any different."

"Of course it's different," Fogerty snapped. "And if you even *think* about trying to take advantage of him that way—"

"Taking advantage?" Jerry asked mildly. "You mean like a six-hundred-pound government gorilla trying to gouge a poor innocent theater manager on ticket prices?"

Fogerty glared daggers at both of us. But he didn't have time for a fight, and we all knew it. "Fine," he bit out. "Full ticket prices for the whole entourage."

"And full payment for the crew handling the alterations?" Jerry asked.

"We'll be doing it all ourselves," Fogerty gritted. "My people are already downstairs, waiting for the green light."

"Well, then, I guess I'd better give it to them," Jerry said, reaching for his phone. "A pleasure doing business with you, Mr. Fogerty."

The alterations took only a few hours, about the same time it took to get the ambassador and the rest of the entourage up from Washington and settled into a hotel a couple of blocks from the St. James. We headed out that evening for the theater in the ambassador's special car, which would have been a major challenge to drive in midtown Manhattan if the police hadn't cordoned off the area for us. I'm sure that stunt made us lots of friends among the local drivers. Probably just as well we couldn't hear what the cabbies were saying.

The theatergoers at the St. James, to my mild surprise, seemed to take the whole thing pretty much in stride. There'd been some hassles at Jerry's end, I knew, sorting out the people who'd already bought the seats Fogerty had appropriated, but they'd all been moved or paid off or otherwise placated, and by the time we walked in with the ambassador everyone was feeling cordial enough to give him a round of polite applause. I presume he understood—there'd certainly been enough applause on the TV programs the Fuzhties had pilfered—but if he was either pleased or annoyed he didn't show it. Fogerty showed him to his chair—which had indeed required the removal of a square block of nine seats—and the rest of us filled in behind him. The house lights dimmed, the curtain went up, and the play started. In the reflected light from the stage I saw Fogerty lean back in his seat and cross his legs, the tired but smug image of a man who has faced yet another political brush fire and successfully stomped it out.

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He got to be smug for exactly three minutes.

I had given up trying to see anything around the ambassador's bulk when, without warning, he heaved himself to his feet. Someone behind me gasped—the Trinidadian representative, I think—and I remember having the fleeting, irrational thought that the ambassador had realized I couldn't see and was courteously getting out of my way. An instant after that I realized how absurd that was, and my second thought was that he must have to go to the bathroom or stretch his legs or something.

He didn't. With a roar that shook the spotlight battens, he climbed up on the empty seat backs in front of him and made a ponderous beeline for the stage.

The actors froze into statues, staring wide-eyed at this pinfeathered Goliath bearing down on them in slow motion. Making his way across the seats and the covered orchestra pit, he made a huge bound up onto the stage, landing with a thud that must have shaken the whole block. He turned around, filled his lungs, and bellowed.

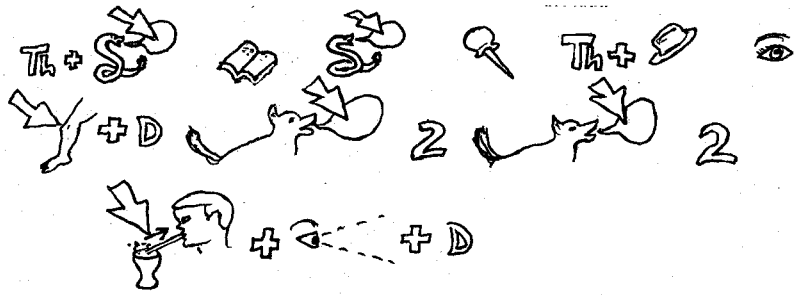
You've never seen a theater clear out so fast. The orchestra and mezzanine both—it just emptied out like someone was giving away free beer outside. It was a miracle that no one was killed or seriously injured; even more of a miracle, in my book, that no one filed any lawsuits afterward for bruised shins or torn clothing. I guess the thought of facing a huge unpredictable alien in court made quiet discretion the smart move on everyone's part.

But at the time, I wasn't convinced any of us would be getting out of the St. James alive. With the ambassador's second bellow even the actors lost it, scurrying for the wings like they'd spotted a critic with an Uzi. I was cowering in my seat, trying desperately hard to be invisible, unwilling to move until I had a straight shot at an exit that wasn't already jammed with people. The ambassador, still bellowing, had begun pacing back and forth across the now empty stage when Angus grabbed my arm. "Look!" he shouted over the hysterical bedlam.

"I see him!" I shouted back, momentarily hating Angus for drawing unnecessary attention our direction. "Shut up before he—"

"No!" Angus snapped, jabbing a finger at the RebuScope monitor he was carrying. "He's not just roaring at nothing—he's *talking* to us!"

I looked at the RebuScope . . . and damned if he wasn't right.



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"Fine," I shouted. "So what does it mean?"

"I don't know," Angus said. More pictures were starting to scroll along the screen; punching for a hard copy, he tore off the first part of the message and thrust it into my hands. "Here—see what you can figure out."

I shrank back into my seat, half of my attention on the paper, the other half on the ambassador still pacing and roaring. *Th-hiss book hiss awl th-hat eye knee-d—*

None of this made any sense. It really didn't. In the five weeks I'd been with the ambassador he'd never so much as raised his voice.

Howl two howl two drink—

And anyway, what in the world could be important enough for him to interrupt a play for? A play he himself had asked to attend?

Drink? No, not drink. Straw? Howl two straw? No. Ah—suck. Howl two suck-see-d . . .

And then, with a sudden horrible jolt, I had it. I took another look at my sheet—glanced at the new pictures Angus was getting—

"I've got it!" I yelled, grabbing Angus's arm and waving my paper in front of him. "'This book is all that I need / How to, How to Succeed.'"

He blinked at me. "What?"

"It's part of a song," I told him. "The opening song from the classic musical 'How to Succeed in Business Without Really Trying.'"

Angus looked up at the ambassador, his mouth falling slightly open. "You mean—?"

"You got it," I said. "The ambassador's not *talking* to us. He's *singing*."

It took till after midnight for Fogerty to get the preliminary damage control finished with the St. James management. An hour after that, he held a council of war in the hotel.

A very small council of war, consisting of Fogerty, Angus, and me. I'm still not exactly sure why I'd been included, unless that as our resident Broadway expert I was the one Fogerty was planning to pin the fiasco on.

Not that he wasn't willing to apportion everyone a share of the blame if he could manage it. Fogerty was generous that way. "All right, MacLeod, let's hear it," he said icily as he closed the door behind us. "What the bloody-red hell happened?"

"The same thing that's happened before, sir," Angus said calmly, letting Fogerty's glare bounce right off him. "The RebuScope made a mistake."

"Really," Fogerty said, turning the glare up another couple of notches. "The RebuScope. Convenient enough excuse."

"I don't think 'convenient' is exactly the word I would have chosen," Angus said. "But it is what happened."

He pressed keys on the RebuScope monitor, pulling up a copy of the ambassador's original Broadway request. "A very simple error, actually, compared with some we've seen. You see this letter C? It should have been a B."

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A frown momentarily softened Fogerty's glare by a couple of horsepower. "What?"

"The message wasn't 'I want to see a Broadway play,'" Angus amplified. "It was 'I want to *be* a Broadway play.'"

For a long minute Fogerty just stood there, staring down at the RebuScope, a look of disbelief on his face. "But that's absurd," he said when he finally found his voice again. "'I want to be in a—?' No. It's ridiculous."

"Nevertheless, sir, that's what he wants," Angus said. "The question now is how you're going to get it for him."

Fogerty tried the glare again, but his heart was clearly no longer in it. "Me?"

"You're the head of this operation," Angus reminded him. "You're the one who talks to the White House, authorizes the expenditures, and accepts the official plaudits. We await your instructions. Sir."

For another minute Fogerty was silent, gazing at and through Angus. Then, with obvious reluctance, he turned to look at me. "I suppose you have the contacts for this one, too?"

With anyone else who treated people the way Fogerty did, I'd have been tempted to demand a little groveling before I gave in. But, down deep, I suspected that being polite to underlings was as close as Fogerty ever got to a grovel. "I know a few people," I said. "There may be a way to pull it off."

"Seems to me there are at least two stage versions of 'Beauty and the Beast' out there, aren't there?" Angus suggested. "He'd be a natural."

"Wouldn't work," I said, shaking my head. "Too many lines, too much real acting."

"How about a non-speaking role, then?" Fogerty suggested. "Maybe a walk-on part?"

I snorted. "Would *you* travel three hundred light-years for a walk-on part?"

A muscle in his jaw twitched. "No, I suppose not," he conceded. "I suppose that also lets out any chance of using him as part of the set decoration."

"It does," I agreed. "Which leaves only one approach, at least only one I can think of. We're going to have to have a play written especially for him."

Fogerty waved a hand. "Of course," he said, as if it had been obvious all along. "Well. Phone's over there—better get busy."

"What, you mean *now?*" I asked, looking at my watch. "It's after one in the morning."

"New York is the city that never sleeps, isn't it?" he countered, jabbing a finger at the phone. "Besides, we need to get this on track. Go on, start punching."

There were six New York playwrights with whom I had at least a passing acquaintance. The first five numbers I tried shunted me to answering machines or services. My sixth try, to Mark Skinner, actually went through.

"Mr. Skinner, this is Adam Lebowitz," I said. "I don't know if you remember me, but I was assistant set designer when your play *Catch the Rainbow* was at

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the Marquis. I'm the one—"

"Oh, sure," he interrupted. "You're the one who came up with that rotating chandelier/staircase gizmo, weren't you? That was a snazzy trick—tell you the truth, I was damned if I could see how that was going to work when I wrote it into the play. So what's up?"

"I'm currently attached to the State Department group in charge of escorting the Fuzhtian ambassador around," I said. "We're—"

"Oh, yeah, sure—Lebowitz. Yeah, I remember seeing you in the background in one of those TV shots. Couldn't place you at the time—that was you in the brown suit and Fedora sort of thing, right? Sure. So what's up?"

"The ambassador wants to be in a Broadway play," I told him. "We need you to write it for him."

There was a long silence. "You what?"

"We need you to write a play for him," I repeated.

"Ah," he said. "Uh . . . yeah. Well . . . can he act?"

"I don't know," I said. "Oh, and the only translator he brought with him prints everything he says in rebus pictures."

"Uh-*huh*. And you're sure he really wants to do this?"

"We think so. He climbed up on the stage at the St. James tonight and started singing from 'How to Succeed.'"

Mark digested that. "So you're wanting a musical?"

"I don't think it really matters," I said. "Fuzhtian singing voices seem to be the same as their speaking ones, except a lot louder. Might help with stage projection, but otherwise it's not going to make much difference."

"Yeah," Mark said. "And how loud can you make a rebus, anyway? OK, sure, I'll take a crack at it. How soon do you need this?"

I looked at Fogerty. "He says sure, and how soon."

"Tell him two days."

I goggled. "What?"

"Two days." Fogerty gestured impatiently at the phone. "Go on, tell him."

I swallowed. "Mr. Fogerty, the head of the delegation, says he needs it in two days."

I don't remember Mark's response to that exactly. I do know it lasted nearly five minutes, covered the complete emotional range from incredulity to outrage and back again, tore apart in minute detail Fogerty's heritage, breeding, intelligence, integrity, and habits, and never once used a single swear word. Playwrights can be truly awesome sometimes.

Finally, he ran down. "Two days, huh?" he said, sounding winded but much calmer. "OK, fine, he's on. You want to tell him what it's going to cost?"

He quoted me a number that would have felt right at home in a discussion of the national debt. I relayed it to Fogerty and had the minor satisfaction of seeing him actually pale a little. For a second I thought he was going to abandon the whole idea, but he obviously realized he wouldn't do any better anywhere else.

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So with a pained look on his face he gave a single stiff nod. "He says OK," I told Mark.

"Fine," Mark said, all brisk business now. "I'll have it ready in forty-eight hours. Incidentally, I trust you realize how utterly insane this whole thing is."

Privately, I agreed with him. Publicly, though, I was a company man now. "The Fuzhties have a great deal to offer humanity," I told him.

"I hope you're right," he grunted. "So where do you want the play delivered?"

The next two days were an incredible haze of whirlwind chaos. While Fogerty and a skeleton crew escorted the ambassador on a tour of New York, the rest of us worked like maniacs to organize his theatrical debut. There was a theater to hire on a couple of days' notice—no small feat on Broadway—a complete stage crew to assemble, a casting agent to retain for whatever other parts Mark wrote into this forty-eight-hour wonder, and a hundred other details that needed to get worked out.

To my quite honest astonishment, they all did. We got the Richard Rodgers theater hired for an off-hours matinee, the backstage personnel fell into line like I'd never seen happen, and Mark got his play delivered within two hours of his promised deadline.

The play was a masterpiece in its own unique way: an actual, coherent story completely cobbled together from famous scenes and lines from other plays and movies. Fogerty nearly had an apoplectic fit when he saw it, wondering at the top of his lungs why he should be expected to pay a small fortune for what was essentially a literary retread. I calmed him down by pointing out that (A) this would allow an obvious entertainment buff like the ambassador to learn his lines with a minimum of rehearsal time, which would get this whole thing over with more quickly and enable us to get out of our overpriced Manhattan hotel and back to the overpriced Washington hotel which the government already had a lease on; and (B) that Mark had even managed to choose scenes and lines that should translate reasonably well on the RebuScope, which would help make the show at least halfway intelligible for the audience. Eventually, Fogerty cooled down.

We met at nine sharp the next morning for the first rehearsal . . . and, as I should have expected, ran full-bore into our first roadblock.

"What's the problem now?" Fogerty demanded, hovering over Angus like a neurotic mother bird.

"I don't know," Angus replied. "It's the same message that started this whole thing: 'I want to be in a Broadway play.'"

"So he's in one," Fogerty bit out, throwing a glare up at the brightly lit stage. The ambassador was standing motionless in the center, repeating the same message over and over, while the other actors and crew stood nervously watching him, most of them from what they obviously hoped was a safe distance. News

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of the St. James incident had clearly gotten around.

"I know that, sir," Angus said calmly. "Perhaps he doesn't understand the concept of rehearsals."

Fogerty trotted out the next in line of his exotic curses, sharing this one between the RebuScope and the ambassador himself. "Then you'd better try to explain it to him, hadn't you?"

Angus stood up. "I'll try, sir."

"Wait a minute," I said suddenly, looking over Angus's shoulder. "That doesn't say 'I want to be *in* a Broadway play.' It says 'I want to *be* a Broadway play.'"

"What?" Fogerty looked over Angus's other shoulder.

"There's no 'in' in the message," I explained, pointing. "See? 'Eye w-ant to—'"

"I see what it says," Fogerty snapped. "So what the hell does it mean?"

Angus craned his head to look at me. "Are you suggesting. . . ?"

"I'm afraid so," I said, nodding soberly. "He wants to be a Broadway play. The *whole* Broadway play."

There was a moment of shocked silence in which the only sound was the ambassador's rumbling. "He must be joking," Fogerty choked out at last. "He can't do a one-man show."

"Would it be any more incomprehensible to an audience than what we've already got planned?" Angus pointed out heavily. "None of this really makes any sense in the first place."

Fogerty turned a glare on me. "I am not," he said, chewing out each word, "mortgaging the White House to pay for another play."

"The Fuzhties have a great deal to offer humanity," I reminded him. "If we don't keep him happy—"

"I am not," he repeated, gazing unblinkingly at me, "paying for another play."

I looked up at the stage, trying to think. A one-man play. . . . "Well, then, we'll just have to use this one," I said slowly. "The ambassador's already got the lion's share of the lines. If we just take the other actors off the stage. . . ."

"Rear-project them, maybe?" Angus offered. "Like—like what?"

"Like they're all part of a dream," I said. "The whole thing can be done as a monologue: his reminiscences of life on the stage."

"You're both crazy," Fogerty said. But there was a thoughtful tone in his voice, the tone of someone who has exactly one straw to grasp at and is trying to figure out where to get the best grip on it. "You think you could do the rewrite, Lebowitz?"

I shrugged. "You'd do better to see if Mark would—but if you'd rather, I could probably handle it," I corrected hastily at the sudden glint in his eye. "But it would take some time."

"You've got three hours," he said, snapping his fingers and gesturing his secretary over to us. "Lee can handle the typing and other paperwork. You concentrate on being creative."

It turned out to be easier than I'd expected to convert the play down to a

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one-man format, and I still sometimes wonder if Mark deliberately designed it with that possibility lurking in the back of his coffee-soaked mind. Still, the whole job took nearly four hours, and Fogerty was about ready to climb the scrims by the time Lee and I emerged from the basement dressing room where we'd been working.

"Took your sweet time about it," he growled, snatching the sheaf of paper.

"You want it good or you want it fast?" I quoted the old line.

"I want it fast," he retorted, rifling through the pages. "Who's going to know from 'good' on this thing anyway? Come on."

He led the way onto the stage, where the ambassador was bellowing at the top of his lungs. Singing, Fuzhtie style. Vaguely, I wondered which musical he was doing this time. "While you two were twiddling your thumbs down there, we got a sort of rear projection system put together," Fogerty told us. "That'll take care of the other actors—excuse me; the *extras*. The bad news is that we've only got a couple of hours now before we have to clear out for today."

"That should be enough time for a run-through," I said. "And the ambassador seems to be a quick study. Let's try it."

We did, and he was. But even more than that: if Angus was interpreting the RebuScope messages correctly, he absolutely loved the play. We got all the way through it and were five pages into a second reading when the stage manager arrived to kick us out.

The ambassador didn't want to leave, of course, and seemed quite prepared to make a major diplomatic incident out of it. Fortunately, Fogerty had anticipated this one and had already arranged to rent one of our hotel's ballrooms so that we could continue the rehearsal over there. The ambassador acceded with what I thought was uncharacteristic good grace, and we all trooped back. For a long time after that, through the wee hours of the morning, you could hear his dulcet singing tones from everywhere near the ballroom, as well as from certain portions of two other floors. Rumors that he could also be heard in Brooklyn were apparently unfounded.

We had one more day of rehearsals, and then it was opening night. Opening afternoon. Whatever.

I'd been too busy the past few days to get around to wondering exactly what Fogerty was going to do about an audience. I suppose I was assuming he would simply round up the members of the local Federal employees' unions—and any other warm bodies he could find—and plop them down in theater seats, at direct gunpoint if necessary.

Nothing could have been farther from the truth. New York Mayor Grenoble and half the city council had turned out to see the play, along with several high-ranking members of the governor's office, and even the Vice President and a Secret Service contingent. The rest of the theater was packed with playwrights, actors, and your basic upper-crust New York intelligentsia. Somehow, Fogerty had managed to get this billed as The Event of the Season, and no one who con-

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sidered himself a theater aficionado was about to miss it. Under the circumstances, I wasn't surprised to learn Fogerty was also charging them $150 apiece.

They finished filing in, settled into their seats, and stopped rattling their programs. The house lights dimmed, the curtain went up, and the play started.

And to my utter surprise and endless relief, it was great.

I don't mean the ambassador was great as an actor. His Fuzhtian expressions and body language—if he had any—were completely opaque to the human audience. His singing voice as already noted was merely a much louder version of his speaking voice, and his speaking voice itself was no great shakes to begin with. Mark's play wasn't particularly impressive, either, though I have no doubt that it was the best Broadway play ever conceived and written in under fifty hours.

Yet in some weird and inexplicable way, it all worked. What the ambassador lacked in acting ability he more than made up in sheer raw stage presence; his inability to sing his way out of a laundry sack created a strangely effective Yin/Yang with the rear-projected background singers; and over and through it all was woven the unceasing and surrealistic flow of pictures from the RebuScope.

And when it was over, they gave him a standing ovation.

"Well," Fogerty said, watching from the wings as the ambassador lumbered out for his fourth curtain call. "Thank God that's over."

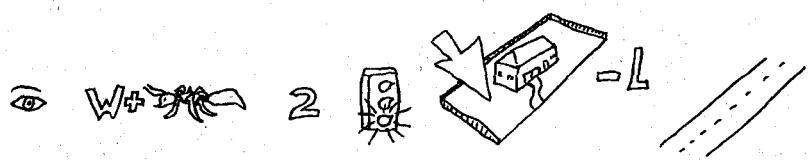
"Yes," I agreed, watching the ambassador do the Fuzhtian version of a bow, which to me looked more like a seriously deformed curtsy. "It was fun while it lasted."

Fogerty gave me a look which would probably have been one of his famous glares if he'd had any emotional energy left to glare with. "You must be joking."

"No, really," I insisted. "It felt good to be on Broadway again. I hadn't realized how much I'd missed it."

"Missed the fawning and applause, you mean," he countered. Glares were out, but he could still handle snide. "Well, better tuck the greasepaint back in your suitcase. Time for you to go back to being anonymous again."

"I'm not so sure about that, Mr. Fogerty," Angus said, coming up to Fogerty's side and showing us his RebuScope monitor. "Here's what the ambassador said right after his second curtain call."



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"At least it doesn't have the word 'Broadway' in it," Fogerty grunted. "You have a translation yet?"

"I'm not sure," Angus said. "It seems to be 'eye w-ant to go on street.'"

I sucked in my breath. "That's not *street,*" I said carefully. "It's *road.*"

Fogerty frowned at me. "'Go on road'? What in hell does that—?"

And then, suddenly, he got it. But to my amazement, his face actually brightened. "On the *road,*" he said. "He wants to take the play *on the road.*"

I threw Angus a look, saw my same surprise mirrored there. Fogerty, actually happy about this?

"No, I'm not having a breakdown," Fogerty assured us. "We'll take it on the road, all right. But this play is too good to waste on humans. We're going to take it to the *Fuzhtian* worlds."

He smiled with brittle slyness. "And along the way, I expect we'll finally get a look at some of this wonderful Fuzhtian technology we've been dying to see."

He gestured across the backstage to Lee. "Start getting everything organized," he called over the applause from out front. "We're taking this show on the road."

And we did. For three months we slogged across space in the ambassador's starship, stopping at star after star, planet after planet, theater after theater. Setting up, watching the ambassador play to packed houses, tearing down, and moving on again.

For the rest of the crew and me it was a lot of work, though fundamentally not a lot different than doing a tour back in the States. Fuzhtian worlds—and there were a *lot* of them—each had their own peculiar odors and sounds and colors and climates; but when you get right down to it, roast leg of *glimprik* and steamed *colfia* vegetables taste the same everywhere you go.

For Fogerty and the tech boys in the entourage, though, this tour was hog heaven. Every little gadget that fell into their hands, no matter how small or seemingly insignificant by Fuzhtian standards, had them salivating for hours as they carefully took it apart to see if they could figure out how it worked. In those three months they must have filled forty notebooks and at least that many multi-gigabyte CD-ROMs. Fogerty looked simultaneously more harried and more excited than I'd ever seen him, continually speculating about what we'd learn when we were able to get a look at their *really* interesting stuff. Unbelievable as it would have seemed to me when I first joined the group, the man was actually becoming a pleasure to be with.

And he was like that right up until the other shoe finally dropped.

I knew something was wrong the instant Angus sat down at my breakfast table and I got a look at his face. "What is it?" I asked, my *courf* melon cubes suddenly forgotten. "What's wrong?"

"Have you seen Mr. Fogerty?" he asked, his voice under rigid control.

"I don't think he's up yet—he and the tech boys were working late on that

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aroma-making gadget," I said. "What's wrong?"

Angus turned his head to gaze out the window at the Fuzhtian city stretching out beneath our hotel. "We were wrong, Mr. Lebowitz," he said quietly. "Our Broadway star here wasn't an ambassador at all. Not really. He was—" He waved a hand helplessly. "He was a penguin."

I set down my fork. "A penguin?" I asked carefully.

"Oh, not a real penguin, of course," he said. "That's just the image that jumped to mind." He sighed and looked back at me. "You've seen the nature specials. Seen all those penguins gathering at the edge of an ice floe in their little black and white tuxedos, flapping their flippers, all set to start hunting for breakfast. Do you remember why they don't all just jump in and get on with it?"

I glanced down at my own breakfast. "I must have missed that episode."

"It's because they're not the only ones on the hunt." Angus picked up my fork and began absently stirring the *courf* cubes in my dish. "There may be killer whales or other predators lurking under the surface, you see. So you know what the penguins do?"

"Tell me."

He stirred the cubes a little more vigorously. "They all keep jostling together on the edge until one of them gets jostled enough to fall into the water." He flicked the fork, and one of my cubes flipped up over the edge of the dish and landed on the table. "If nothing eats him," he said, gazing down at the cube, "the rest know it's safe to start going about the day's business."

I gazed at the piece of melon, watching the juice ooze onto the table. "All right," I said slowly. "So the ambassador was pushed into the water. But I'd have thought that we've treated him pretty well. Certainly no one's tried to eat him."

Angus snorted. "Oh, we treated him well, all right. We treated him too damn well. He's done it, he's lived through it . . . and now they all want to do it, too."

"Do what?" I asked, frowning. "Come to Earth?"

He looked up at me with a haunted expression. "No," he said. "Star in a Broadway play."

I felt my jaw fall open. "*All* of them?"

He nodded. "*All* of them."

We're on the last leg of the ambassador's tour now—two more planets, fifteen more shows, and then our ship will be heading back to Earth. Our ship, and two hundred more following right behind us. Packed to the gills with eager, star-struck Fuzhties.

I don't know what the White House and UN officials said to Fogerty when he broke the news to them. I know that when he came out of the ambassador's communication room he had the grim look of a man who's just watched his career crash in ruins, in glorious full-color slow motion.

Still, we may yet be able to pull this off. Assuming the officials accepted our suggestions, there should be hordes of workmen at this very moment scurrying

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around the Gobi, the Sahara, the Australian Outback, and a dozen other of the remotest places on Earth. Building a hundred exact movie-lot-style replicas of Broadway for the Fuzhties to perform on. With luck, they'll all be ready by the time we get back. If not, the real Broadway will never be the same again.

They say the Fuzhties have a great deal to offer humanity. They had better be right. ■

IN TIMES TO COME

Our March issue features three quite different novelettes by three favorite *Analog* authors. The one with the cover is "Sam Boone's Rational Choices," which should be of special interest to readers who've enjoyed Bud Sparhawk's other tales of Sam Boone. This one tells how the distinguished diplomat met his boss, Ahbbbb—and it's at least as outrageous as the others (which appeared earlier but take place later). We're also especially pleased to offer our first story in too long by Michael F. Flynn, a much more serious story of the sacrifices people must make to achieve big dreams, as well as a rambunctious romp with a wild ecological basis by Stephen L. Burns.

There'll be shorter stories, too, of course, by such writers as Charles Sheffield and Kevin O'Donnell, Jr. Paul Levinson provides the fact article, on "colleges without campuses": the new phenomenon of on-line education. I can't think of anybody better than Paul to write such an article, because he has for some years run just such a college!

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THE ALTERNATE VIEW G. Harry Stine

ENGINEERS EXPOSED!

People who work in the fields of science and technology are not like other people. This can be frustrating to nontechnical people who have to deal with them. The secret of coping with technologically oriented people is to understand their motivations. This column will teach you everything you need to know. Over the past 45 years, I've gained extensive experience in this field. For example, I learned the customs and mannerisms of engineers by living among them and observing them in much the same way Jane Goodall learned about the great apes.

At first, every engineer demands going back to "Square One" and getting the basic definitions, boundary conditions, and assumptions fully understood. Therefore, we shall do the same and go to the best definition I've ever found:

"*An engineer* is one who passes as an exacting expert on the basis of being able to turn out with prolific fortitude infinite strings of incomprehensible formulae calculated with micrometric precision from extremely vague assumptions based on debatable figures obtained from inconclusive experiments carried out with instruments of problematic accuracy by persons of doubtful reliability and questionable mentality for the avowed purpose of annoying and confounding a hopelessly chimerical group of esoteric fanatics referred to altogether too frequently as the Front Office."

Engineering is trendy these days. The word "engineer" is excessively overused. If someone is observed trying to pass as an engineer, give the Engineering Evaluation Test to discern the truth:

Lead the person into a room where a picture is obviously hanging crooked. Upon seeing it, the subject will either: (a) straighten it, (b) ignore it, or (c) buy a CAD system and spend the next six months designing a solar-powered, self-adjusting picture frame while often stating aloud the belief that the inventor of the nail was a complete idiot.

The correct answer is (c) but partial credit can be given to anyone who, when asked about it, replies thoughtfully, "It depends," or simply blames the whole stupid incident on "marketing."

Engineers are fascinated with gadgets. Engineers like to solve problems with gadgets. If no problems are handy and available, they'll create problems. Normal people don't understand this concept; they believe

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that if it ain't broke, don't fix it. Engineers believe that if it ain't broke, it doesn't have enough features yet.

No engineer looks at a television remote control without wondering if it could be modified into a phaser. No engineer can take a shower without wondering if some sort of Teflon™ coating on human beings would make showering unnecessary and thus conserve water. To the engineer, the world is a toy box full of sub-optimized and feature-poor toys with low play value.

Engineers are always honest in matters of technology and human relationships. That's why it's a good idea to keep engineers away from customers, romantic interests, and other people who can't handle the truth.

Engineers sometimes bend the truth a little bit to avoid work because at the very core of every engineer lies an innate belief in the Principle of Least Effort. Engineers are intrinsically lazy. They make statements that sound like lies but technically aren't because they really don't expect anyone to believe them. An incomplete list of engineer lies is listed below.

"I won't change anything without asking you first."

"I'll return your hard-to-find part/tool/gadget tomorrow."

"If you want me to do this job, I'll have to have new equipment."

"No, I'm not jealous of your new computer."

"I know the Chief Engineer likes it his way, but he won't object to my innovative approach."

In spite of their basic need to play with the newest toys, engineers are notoriously frugal. They aren't cheap or mean-spirited. To an engineer, every spending situation is simply a problem in optimization—that is, "How can I escape this situation while retaining the greatest amount of cash?"

However, if one trait basically defines an engineer, it is the ability to concentrate on one subject to the complete exclusion of everything else. This sometimes causes engineers to be pronounced dead prematurely. Some funeral homes in high-tech areas have started checking resumés before processing the bodies. Anyone with an engineering degree—especially in electrical, civil, or mechanical engineering—or experience in computer programming is propped up in the lounge for a few days and periodically checked for signs of movement.

Another positively identifying engineer trait is the loathing of risk. Engineers hate risk. "The bridge must not fall down; the wing must not come off the airplane," is a favorite litany learned in the early years of Engine School. Engineers try to eliminate risk whenever they can. This is understandable, given the fact that when an engineer makes one little bitty mistake, the news media will invariably treat it as a big deal that proves we should all go back to hunting with stone axes and living in trees. Some recent examples include: the *Hindenberg*, the space shuttle *Challenger*, the Hubble space telescope, the Tacoma Narrows Bridge, Apollo 13, the S.S. *Titanic*, the Ford Pinto, and the Chevrolet Corvair.

All engineers make a risk/reward calculation for every job they take.

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Each has a personal equation, but the result is always the same:
RISK (public humiliation)/REWARD (a certificate of appreciation in a handsome plastic frame) <<1.000.

Being practical people, engineers always evaluate this balance of risks and rewards and come to the conclusion that risk is Not Good. The best way to avoid a high-risk assignment is to advise all nontechnical people that the activity is technically impossible for reasons far too complicated to explain.

If that approach isn't sufficient to halt a project, then the engineer will fall back to a second line of defense: "It's technically possible but it will cost too much."

However, intelligent nontechnical people such as supervisors and CEOs have learned that two factors are important to engineers: (1) How smart they think they are, and (2) how many cool gadgets they own or use. Therefore, the fastest way to get an engineer to solve a problem is to declare that the problem is unsolvable. No engineer can walk away from an unsolvable problem until it's solved. No illness or distraction is sufficient to get the engineer off the case. These types of challenges quickly become a personal battle between the engineer and the laws of nature.

Engineers will go without food and hygiene for days to solve a problem. Sometimes they just forget these mundane matters. When they succeed in solving the problem, they experience an ego rush that's better than sex—including the kind of sex where other people are involved with them.

Nothing is more threatening to an engineer than the suggestion that another engineer has more technical skill. Normal people sometimes use that as a lever to extract more work from an engineer. For example, when an engineer says that something can't be done (a code phrase that means it's not fun to do), some clever nontechnical people have learned to glance at the engineer with a look of compassion and pity while saying something like, "I'll ask Bob. He knows how to solve difficult technical problems."

At that point, it's not a good idea to stand between the engineer and the problem. The engineer will set upon the problem like a starved Chihuahua with a pork chop.

When solving social problems or even admitting that such things exist, engineers exhibit behavior patterns that have recently entitled them to the appellation "nerd." Other words have been applied in the past. However, this difference in social behavior is simply because engineers have different objectives when it comes to social interaction.

"Normal" nontechnical people expect such unrealistic accomplishments from social interaction as (a) stimulating and thought-provoking conversation, (b) important social contacts, and (c) a feeling of connectivity with other humans.

On the other hand and in contrast to "normal" nontechnical people, engineers have rational objectives for social interactions such as (a) get it over with as soon as possible, (b) avoid getting invited to something unpleasant, and (c) demonstrate mental superiori-

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ty and mastery of all subjects.

From the social standpoint and in concert with many academicians, clothes are the lowest priority for an engineer, assuming the basic thresholds for temperature and decency have been satisfied. If no appendages are freezing or sticking together, and if no genitalia or mammaries are swinging around in plain view, then the objective of clothing has been met. Anything else is a waste of time, effort, and textile material.

Engineers are voracious readers, devouring a paperback mystery in 20 minutes and grabbing everything Tom Clancy gets published. Engineers love all of the *Star Trek*® television shows and movies. No wonder! The engineers on the Starship *Enterprise* are portrayed as heroes, occasionally even having sex with aliens. This is much more glamorous than the real life of an engineer, which consists of (1) fighting off normal people who want power over other people instead of power over the Universe, (2) fiddling with finicky numbers for months on end to produce a gadget that requires continual tweaking but makes Marketing happy, and (3) beating off predatory persons of the opposite sex who hunt them down relentlessly for reasons that will become obvious in a moment.

Dating is never easy for engineers. A normal person will employ various indirect and duplicitous methods to create a false impression of attractiveness. Engineers are incapable of placing appearance above function. In the words of one great fictional engineer, "One does not place tassels on an electric motor."

Fortunately, engineers have an ace in the hole. They are widely recognized as superior marriage material. They are viewed as intelligent, dependable, employed, honest, and handy around the house. While it's true that many normal people wouldn't knowingly date an engineer, they harbor an intense desire to mate with them to produce engineerlike children who will have high-paying jobs long before losing their virginity.

Male engineers reach the peak of sexual attractiveness later than normal men, becoming irresistible erotic dynamos in their mid-thirties to late forties.

Female engineers become irresistible at the age of consent and remain that way forever.

Thus, the subspecies survives and multiplies. Never in recorded history has it become endangered because nontechnical people don't know how to turn the crank that makes the world go around and, if they did, couldn't fix it when it broke as the engineers designed it to do. If not totally accepted, engineers are therefore tolerated.

And that's all you need to know about engineers—except to add this quote from a modern engineer and science fiction writer, L. Sprague de Camp:

"Civilization, as we know it today, owes its existence to the engineers. These are the men who, down the long centuries, have learned to exploit the properties of matter and the sources of power for the benefit of mankind." ■

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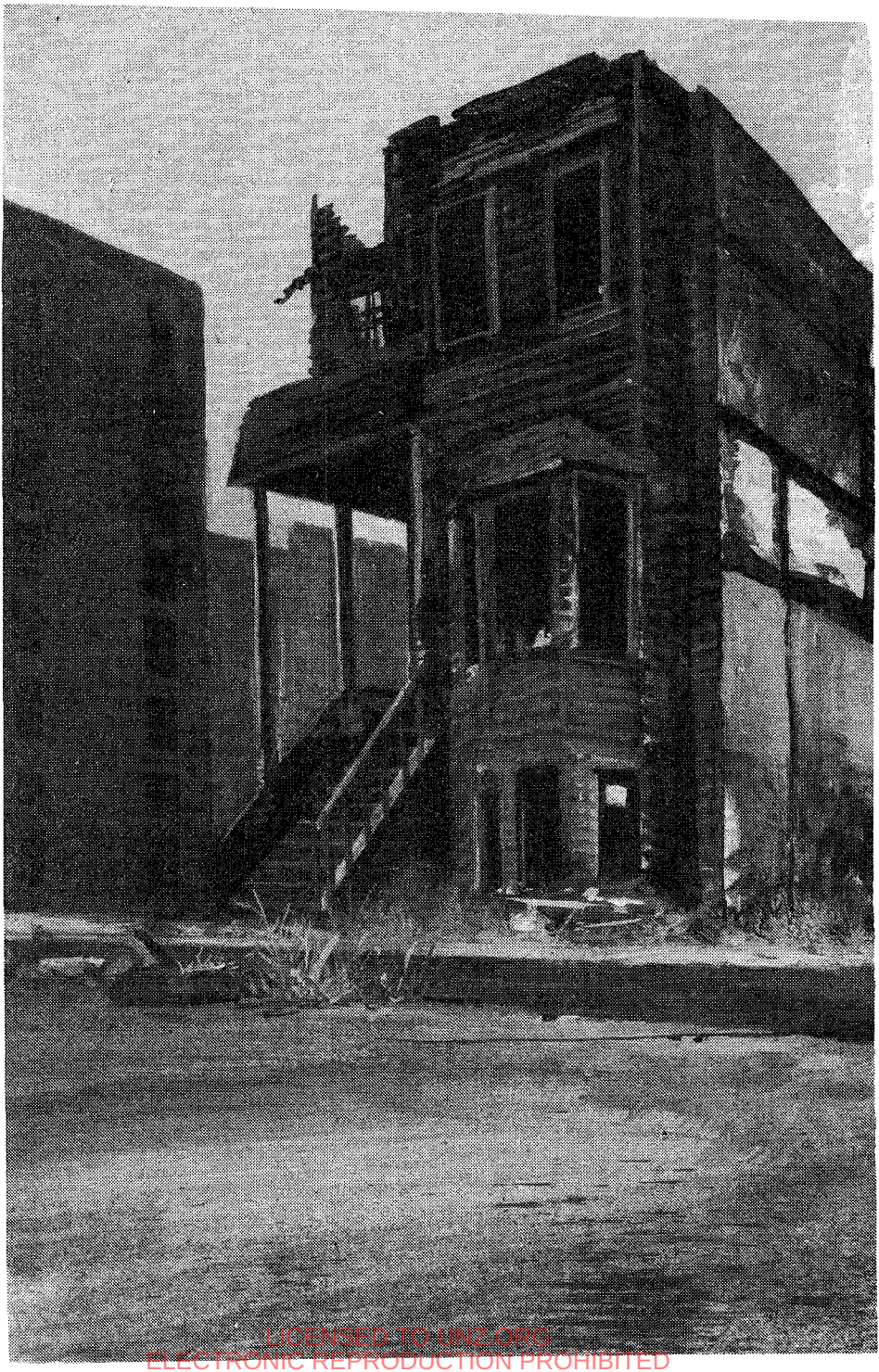

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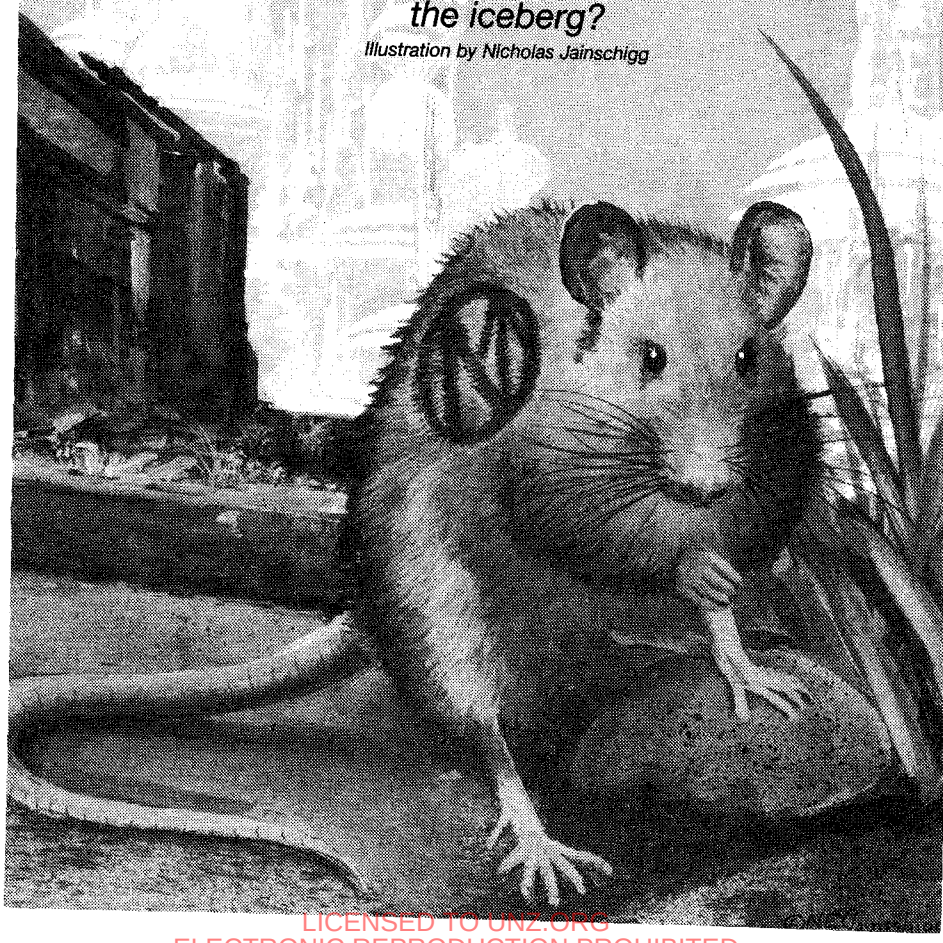
David Phalen

CHASING THE IDEA RAT WITH MY BEST FRIEND, JAIME

Legends often contain a rather prosaic kernel of truth. But what if the legend is just the tip of the iceberg?

Illustration by Nicholas Jainschigg



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Jaime hits me hard on the arm, nods toward the rusted metal grate covering a window well of the soot-blackened brick tenement we're passing. A thick, pinkish-brown tail, maybe ten inches long, curls out from the grate, lying on the sidewalk like a taunting smile. I step forward, but the tail slides over the pocked, gray cement and through the bars.

"You get a look at it?" I ask.

"Probably just meat," Jaime says. He pokes the grate with the toe of his sneaker. It moves half an inch, then falls back into place, not nearly as solid as it looks.

We pull together, and the grate comes off with a groan and a snap. It clangs to the sidewalk behind us when we drop it. The window well is a three-foot drop into a muddy, trash-filled puddle. A jagged hole has been gnawed through a corner of the water-stained piece of plywood covering the window. The tail and a slick, gray-furred ass are still on our side of that hole, but only for a second before a six-clawed hind foot pushes the body the rest of the way through.

Jaime beats me in the scramble to get into the well first. We've finally found an Idea Rat.

Idea Rats were second only to Pinch as the cause of dropouts from the Inner-Consolidated School System, where I met Jaime. Every kid talked of knowing somebody who knew somebody who once chased an Idea Rat and almost caught it. Weak as it was, that dream offered more than anyone ever got from ICSS.

Jaime showed up at my school in fifth grade planning to drop out, but I never thought I'd leave early. Every year, I was the special project: the kid who made the teachers forget their failures because they thought they were making a difference in at least one life. I'd take whatever tests they wanted to give me, do extra homework assignments. I was never particular about favorite subjects or teaching methods—I just wanted to learn.

Whether I wanted the special treatment or not didn't matter to the other kids. To them, I was just the teachers' pet: not trusted, not included in any of the cliques that constantly formed, broke apart, reformed. I always wondered what it would be like to eat lunch at a table with a large group around it, to be in the middle of other kids when they played stickball on the playground. To listen to what they thought of things, find out if my ideas and experiences were the same as theirs, or at least how they were different.

All I ever did was wonder. Until Jaime came to ICSS, I didn't have any friends.

Jaime pulls the plywood away from the window and passes it up to me. A greenish-white powder of mold dusts my hands before I drop the wood to the sidewalk, next to the grate. Jaime pushes against a glassless window, swinging it up and open. He sticks his head through into the basement beyond. After a few seconds, he pulls back out.

"Hold this up for me," he says. I drop into the well next to him and

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take the window. Jaime slides through into darkness.

I look in after him, my eyes taking some time to adjust from the sunlight. The room I finally focus on is large, maybe thirty-five feet square. Two boarded-over doorways are on the wall across from the window. A smaller opening, also boarded shut, is in the middle of the wall to my left. An indeterminate pile in the corner is probably some pinchhead's bed or final resting place. A crooked circle of broken cinder blocks in the center of the room forms a makeshift fireplace that hasn't been used in a while. The place has the damp, musty smell pretty much universal to basements.

I drop softly to the concrete floor beneath the window. I untie the durafab bag from around my waist, pull it from my belt loops. Jaime moves quietly toward a cobwebby set of wooden stairs along the right-side wall. He holds his bag ready. As I move behind him, I see the Idea Rat on a step about halfway up. Its snout is raised, testing the air. Satisfied, it grabs the next step up and pulls itself that much nearer a closed door at the top of the stairs.

Jaime takes a deep, silent breath through his mouth. For a second, he stands frozen. Then he's a blur of motion, diving up the steps, bag open, outstretched. He lands on the Idea Rat's step so quickly that I'm sure he must have it, but the sound of scampering claws can only mean the impossible has happened; Jaime has missed.

The Idea Rat glides up the last couple of steps and throws itself against the door with a hollow, echoing thud. The door falls slowly into the hallway beyond, hitting the floor with a "Whap!"

The Idea Rat scoots through the opening, barely breaking stride. Jaime and I lose a second staring, but then we're after it again. When I step over the door at the top of the stairs, I notice the knob and all three hinges have been removed. Scrap scavengers are always doing stuff like that.

Most of my teachers were just out of college, putting in time at ICSS because every year they taught there canceled a year of student loans. By comparison, Mr. Rodriguez, my fifth-grade teacher, seemed ancient. His dark hair was grayed almost white in two swoops at the temples, and the deep wrinkles around his eyes had started to spread to the rest of his face, blending with a jagged, C-shaped scar on his cheek. Schoolyard legend said he got that scar in a knife fight with a student. Kids said the janitor eventually carried that student out of the building in a durafab bag.

When Mr. Rodriguez kept Jaime and me after school the Monday following our annual tests, I knew pretty much what was coming. When he turned around a student desk to sit and talk with us, I gave him an encouraging smile. Jaime didn't.

"We scored your Academic Skills Tests over the weekend," Mr. Rodriguez said. "You did well, both of you. Your scores are the highest of anyone at ICSS for as long as I've been here."

I sat up straighter in my seat. Jaime

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rolled his eyes.

"These would be great scores at any school," said Mr. Rodriguez. "Only a few kids anywhere in the country did better. For someone here to score this well is remarkable. I'm going to send your scores to the AST people and see if they'll waive the fee on a retake to be included in the national database." When we didn't show any response, he explained. "It may help you get to college eventually. To get out of here."

Mr. Rodriguez fixed his eyes on a spot somewhere just above our heads. He made a gesture with his hand, encompassing the shabbiness of the place. Three-quarters of the windows were boarded up, and most of the ones remaining displayed cracks so elaborate the glass would have fallen out long ago if it hadn't been bullet-proof reinforced in the mid-'90s. Ink-stained wood showed through in huge patches on the ancient bulletin boards, their cork long since flaked off. Graying blackboards held impossible-to-erase ghost lessons, long ago taught and forgotten. When Mr. Rodriguez continued, his voice was softer, sadder. "You've gotten nothing from this place. These scores could only have come from inside of you."

He shook his head and stood. "I want to show you something." We followed him to the front of the room, through a door that led to his office. He nodded at a large table next to his cluttered desk. I think I probably gasped out loud when I saw what was on it.

Covered by a plastic sheet—opaque with time and dust—was a computer. I knew such things existed, of course, were even common in many places: but not in districts like ICSS.

"We got it with the last of our federal money," said Mr. Rodriguez. "Over ten years ago. We can't afford repairs, so you'll have to be careful. You can access any of the public share libraries, but nothing with a user fee."

The plastic cover gave a dull reflection of the fluorescent ceiling light. Jaime stood beside me, breathing short and sharp through his nose. I imagined he was thinking the same things I was, just realizing that there were answers beyond school. Answers to questions I hadn't even thought of asking yet.

I was right in some ways; Jaime was thinking about answers. But he already knew the questions he wanted to ask.

The public bulbs in the tenement building are gone—broken or stolen long ago. The only light is a shadowy gray that comes through a dusty window at the far end of the narrow hallway. Jaime moves ahead of me, past doors I imagine must hide people waiting to snatch our prize away before we can catch it. Jaime moves straight ahead, eyes scanning only for the Idea Rat; but I can't help glancing from side to side at every door I pass, sure someone is crouching, waiting.

I freeze when I spot a streak of light coming through the crack of a slightly opened door. I brace myself for someone to leap out at me. After a couple of seconds, I hear the low moan of a pinchhead from the other side of the

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door. Then a slight movement takes my eyes to the floor; and I see the wide, round rear end of the Idea Rat slipping through into the room behind the door.

"We don't exist in a vacuum."

Mr. Rodriguez had taken us through a basic tutorial and shown us how to access the most common nets and webs. As he spoke, I couldn't stop looking at the black-on-white keyboard, the shiny face of the monitor. "We are the sum of the elements in our backgrounds. I want you to write a research report on one of the elements that shapes your world. Something that has worked in some way to make you who you are."

Possibilities raced through my mind, things I had always wondered about, questions I had asked my mother when she was still around, my grandparents after she took off.

Mr. Rodriguez smiled, catching a hint of this in my eyes.

"Anything?" said Jaime.

Mr. Rodriguez nodded, prepared to leave and go back to his other students. "Choose something that interests you both, because I want you to work together."

I frowned.

"This is bullshit," Jaime said.

Mr. Rodriguez paused, one hand on the knob of the door leading back to the classroom. A slight smile crossed his face. "Learning to work together is an important lesson all by itself." He left us looking at each other.

"School Deregulation," I said, testing the waters.

"Idea Rats," said Jaime.

"The Urban Guerrilla Wars," I tried.

"Idea Rats," said Jaime.

I squirmed a little in my seat. "The privatization of police forces."

"Idea Rats," said Jaime.

Pushing the apartment door open just wide enough to slip through takes a long time. I crouch low, hoping what worked for the Idea Rat might work for me. I hold my breath and slide into a small alcove of a single-room apartment.

Even in the glow of morning light through the tattered curtains covering the room's only window, the naked woman sitting on the corner of a sagging, gray bed along the far wall is not beautiful. Her shoulders slouch forward; her breasts hang loose and narrow. Limp black hair drapes down over a head impossibly large for her wasted body. Vacant eyes stare in my direction, but if she sees anything, it's not in this room.

The man standing next to the bed wears a yellowed sleeveless T-shirt, but no pants. His mouth moves behind closed lips. Words struggle to get out, but only a low moan escapes. People who haven't been around pinchheads think their moaning shows some type of retardation. The opposite is closer to the truth. Pinch actually enhances neural transmissions to the point that speech becomes impossible. So much is going through a pinchhead's mind, at such a rapid rate, that the overtaxed speech centers just freeze up.

The intensity of the man's moan rises. He clenches his hand into a fist and punches the woman in the face.

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Her head snaps back, but only for a moment. Then she stares forward again. In the final stage of Pinch addiction, the sensory centers of the brain are so fried that pinchheads don't react to any stimuli unless they're high.

A trickle of blood seeps from one nostril, perching for a second on the woman's lower lip before dropping off. It splatters on the floor in front of the Idea Rat, which watches me from the shadows beneath the bed. Its nose twitches; its white teeth seem to glow. A glimmer in its eyes looks like laughter.

Too late, I see the man's bruised legs in front of me. I look up, past the blue veins of his erection, over his scrawny ribs and chest, into his drooling smile. He grabs my hair and pulls me up off the floor.

The ShareLibes were far from conclusive about anything having to do with Idea Rats. The most respected sources made no mention of them. The ragbanks carried self-contradicting data.

Most sources that said anything traced the history of Idea Rats to the Barker Act, which abolished patent and copyright protection so that new ideas could be more cheaply and widely converted into viable technologies. In the fight to keep corporate competitors from legally using new ideas, advances in electronic piracy led businesses back to old-fashioned couriers. When too many couriers turned up dead, corporations began using Idea Rats.

By the early 1990s, artificial chromosomes made it possible to control the blueprints of developing organisms, introducing completely new genetic material into edible plants like tomatoes. The next step allowed chromosomes to be encoded to deliver even non-organic information directly into the gene strings of higher-level creatures. For Idea Rats, according to the sources we found, organic changes included a sixth toe on the left hind foot and a birthmark of the company logo for identification purposes. Top-secret company ideas were encoded as non-organic information, which could be decoded by anyone who knew or could find its precise location on the gene chain.

After two days spent tracking down sketchy, inconsistent reports, I told Jaime I wanted to switch to another subject. He shook his head, the glow of the monitor shining off his face as he searched through another databank. "Not until we find something on Natt."

Calvin Natt was a street legend. Just another kid on his way toward Pinch until he killed a rat with six toes and a corporate logo. He took that rat into an uptown office building, hoping for a reward. No one from the streets ever saw him again.

Everybody talked about him, though. According to folks from our neighborhood, Natt's reward for returning that rat was nothing compared to the money he made when he told a rival company everything he could remember about it. Then he went to the press. By the time Calvin Natt sold his story to everyone he could think of, he had enough money

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to start NattCo, one of the nation's hottest new companies.

Mr. Rodriguez frowned when we told him our subject. He nodded at the computer. "I give you all the information in the world. You give me some pinchhead's daydream?"

I looked at Jaime, but he wouldn't look back at me.

"I don't want to read some bedtime story your mother tells you." The frosted glass in the door leading to the classroom rattled when Mr. Rodriguez slammed it shut behind him on his way out of the room. It was the first and only time a teacher ever got mad at me.

"We're switching topics," I told Jaime.

He typed in a few commands on the keyboard, clicked on something with the mouse, his eyes glued to the monitor screen.

I walked over and tried to push him away from the computer. He grabbed my hand.

"Don't," he said.

I took a step back. "You heard what he said."

He typed some more. "He said we could do anything."

"We'll get a bad grade."

He looked at me then, his face still expressionless, but his eyes bright. He pushed his chair back away from the computer, held his hand out for me to take over. "You want to make the grade, you better find us some facts."

I finally chased down what Jaime was looking for—about a dozen subdirectories deep in a forgotten news group of the Internet, an old network that was one of the original attempts to link all the world's databases. I found financial reports which showed NattCo spent over ten million dollars a year on something listed as "I.R. Retrieval." I found a memo estimating that one in fifty Idea Rats never made its destination. I found maps showing the local offices of NattCo most likely to be the recipients of information passed through Idea Rats.

"Wait till Rodriguez sees this," I told Jaime.

I saw the sharp flicker in Jaime's eyes that was his way of laughing. "You're a genius," he told me.

I shook my head and looked away from him.

"I mean it," he said. "I figured you for just some suck-ass the teachers liked because you did whatever they said."

My ears and cheeks were hot. Jaime reached over and put a hand on my arm. I shrugged it away.

"I'm saying this wrong," Jaime told me. "This is a compliment. I never would have found this stuff by myself."

"So what?"

"So we don't have to write a paper."

The statement sounded so strange that I looked at him again. I couldn't read his expression.

"We can just catch an Idea Rat."

I felt like an idiot for not understanding sooner. "I did this research for our paper," I told Jaime.

Jaime spoke quietly. "You think school's going to get you out of here? When's the last time you heard of anyone from here going to college? We're not supposed to get out. That's why

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we aren't included in the national databases. It's why the government cut off welfare and job-training programs. It's why they abolished the city cops, so we can do any illegal thing we want. They're pumping us full of Pinch, waiting for us to die."

He paused, watching my face, his nostrils wide. "Idea Rats are the only way we have left." It came out as a plea.

I thought of the broken-down school, of classes that got a few students smaller each year. I thought of the reports and the maps and all the little bits of information we had found about Idea Rats.

The decision was already made.

"Uhhhh-ahhhh," says the pinchhead, maybe asking what I am doing, maybe trying to describe what he is planning to do to me. I grab onto his hand with both of mine, barely lessening the pain of hair being pulled from my scalp.

Jaime crashes the door into my back. The force knocks me into the pinchhead and sends him sprawling, still clutching my hair. I land on top of him, and his grip finally loosens as the air is forced from his lungs.

"Under the bed!" I yell at Jaime. I sit up. The pinchhead's breath bubbles raggedly out through his mouth. He's not moving.

On his hands and knees, Jaime flicks his bag under the bed to force the Idea Rat out. It backs away. Then, realizing it can't hide, it climbs the woman's leg. She shows no reaction as it runs up her torso, one claw leaving a long scratch down her chest to a stretched-out, brown nipple. It crawls over her face to the top of her head. She stares vacantly toward the doorway as the Idea Rat hisses at us.

I lunge for it, but Jaime gets there first. He doesn't try to scoop the Idea Rat off the woman's head, as I was planning. Instead, he brings the open end of his bag straight down, capturing the Idea Rat along with most of the woman's upper body. He pulls the drawstring tight.

The Idea Rat does not go gently. The thrashing lump it makes seems to be all over the bag, and its hissing blends with a high-pitched squeal as loud as the brakes on the single, rundown El that still goes through our neighborhood.

"Hit it! Hit it with something!" Jaime yells. He holds the string with both hands. Even the woman is struggling now. Frustrated, Jaime headbutts the bag twice. The woman's body falls back onto the bed.

Jaime lets go and grabs a large black bible from a table next to the bed. The lump of the Idea Rat is moving toward the opening of the bag. Jaime swings at it, and there is a loud, sharp squeak as he connects. The bag is suddenly still, but Jaime hits it two or three more times anyway. He waits, bible cocked back over his shoulder in case he sees more movement. The bubbling breath of the man is the only sound in the room.

Jaime hands me the bible and carefully slips the bag off the woman. At a point near her shoulder he comes to a lump that must be the Idea Rat. He takes his time to make sure it stays inside the bag. There is a smear of

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blood on the woman's neck, but the worst of it comes when Jaime gets the bag past her face. Her nose seems pasted on sideways. Bloody lips are curled back over a jagged-tooth smile. A long scratch opens so much flesh that her eyeball seems ready to slide out. I stare for a long time, but she doesn't take a breath.

"She was just a pinchhead." Jaime drops the bag to the floor between us. I see the lump of the Idea Rat inside, unmoving. Jaime waits for me to open the bag, but I'm afraid I'll find this has been just another chase that has led to nothing. I kick it toward him.

He holds the bottom of the bag, letting the Idea Rat slide out onto the floor. Its head flops loosely. Its front paws stretch out in a final prayer. Its black eyes don't look much different than when it was alive.

Jaime picks it up by the tail and holds it out to me. I uncurl its left hind foot, feeling the unnaturally rough skin of its sixth toe.

The birthmark is right where our research said it should be.

The logo is NattCo's.

I didn't miss home. Jaime always found better places to live than the room I had shared with brothers and half-brothers and cousins at my grandparent's apartment. What I missed about my old life was school. I wondered how Mr. Rodriguez had taken our leaving. Sometimes I wondered if he would let me come back.

One of the first places we lived was an attic storage cubicle of a five-story apartment building. Nobody living in that place was dumb enough to store things outside of their own apartment, so we were never bothered by the tenants. Jaime had cracked the combination of an old padlock he found, and we used that to feel safe behind a thin, plywood door.

It was late fall by then, but enough heat seeped up from below that we never really got cold at night. A light was too dangerous, so after dark we'd sit looking at the streets below through the slits of a small vent in the side of the building. The street world at night was a lot different than during the day. When the Sun was up, kids like us ruled. Jaime and I could walk around without being bothered because other kids didn't know how strong a gang we might belong to. The only adults out during the day had legitimate jobs to go to, so they left us alone.

At night the kids were inside, and adults ruled. As the Sun went down each night, desperate-looking men and women slithered into our line of vision from doorways, sewer drains, or thin air, carrying lanterns and flashlights and bottles and baggies. A constantly shifting party moved like something almost alive below us. People would come together in groups, passing bottles or pills, then drift apart slowly. Fights erupted without warning, generally attracting large crowds, though there were always a few who fled the possibility of stray anger splashing over onto them.

Only occasionally would voices drift up to us—a raucous laugh, a scream: nothing identifiable as human language. Often we heard a shatter of

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glass; gunshots coughed a couple of times a night. We were far enough above these sounds that they never seemed quite real.

What struck me most each evening was the tremendous energy of all those people. That energy had no sense of direction. I tried to imagine what they wanted, what they got out of the nightly dance they performed while Jaime and I watched. They seemed little more than sub-atomic particles bouncing off of each other in completely random, totally unpredictable ways.

"Why do they act like that, you suppose?" I asked Jaime once.

"You serious?" The small amount of light that seeped through the vent wasn't enough to allow me a good look at Jaime's expression, and I hadn't figured out how to read his tone of voice yet back then. Still, I knew him well enough to be on the defensive.

"What do they get out of it, I mean?"

Jaime snorted. "They get nothing. Even an idiot smart guy like you should be able to figure that one out."

I tried not saying anything for a few seconds, but I couldn't let him have the last word like that. "That's what I mean. If they get nothing, why do they act like that?"

"Because that's how they're told to act," said Jaime, as if speaking to the dumbest kid he'd ever met.

I watched a man talking to a woman on the other side of the street. He said something, and the woman raked her nails across his face, then kneed him in the balls. He went down hard, and a couple of people walking by kicked at him as he lay on the ground. The woman walked about ten feet away and started talking to another man. "Nobody tells them to act that way," I said.

"When *everybody's* telling you something, nobody has to tell you anything," Jaime said, as if that made any sense at all.

With the Idea Rat in his durafab bag, Jaime leads us past crumbling tenements, boarded-over store fronts, graffitied brick and concrete walls. We pass wide-eyed derelicts who would kill us simply for the meat we carry, never knowing or caring it was worth a lot more than a meal. Jaime has a knack for finding the least-crowded streets, the safest alleys. I follow him, so confident in his ability that I don't even pay attention to our route.

Soon, the people we pass look less desperate. The streets we walk along start to fill with traffic—plastic electric cars, bright and sleek compared to the rusting hulks that litter the curbs in our part of the city. A tunnel leads us beneath a maglev track, its trains rushing silently overhead. The buildings are taller, cleaner. They contain entire walls of unbroken glass.

We stop in front of the NattCo Building, squinting into the sun glinting off its mirrored windows. A huge revolving door gobbles in and spits out people who all look self-consciously busy, people with someplace to be. I don't want to move any closer, can't imagine myself as one of these purposeful people. I take a step or two back, ready to turn and run, feel-

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ing more like a little kid than I've ever felt in my life.

Jaime's hand on my elbow stops me. I follow weakly as he leads us toward the building, toward those huge spinning doors that will deposit us inside.

"What will it be like, do you think? If we catch one?" I asked Jaime a few months after we left school. I was gnawing the last bit of meat from the thigh of what we were eating. I was trying to make it last, delaying with great anticipation the moment when I would snap the bone and suck delicious marrow for dessert.

"We'll be rich," said Jaime.

"How rich?"

He paused a long time, and I thought he was probably thinking up imaginary scenarios on how we'd spend all the money some company would give us for the Idea Rat we were still sure we'd grab any day. Instead, when he answered, it was short. "Too rich to even think about this place anymore."

I laughed. "Like we could forget all this."

"Be surprised what you can forget when you've got enough money."

"You'd know."

He threw his bone at me and some sharp edge scraped my cheek. He got up and walked to the other side of the room.

"It was a joke," I said, brushing my fingers over my face. I licked off the smear of blood they came away with.

"Yeah," he said. "Funny."

I finished eating in a shadow of silence. The marrow didn't taste as good as I thought it would.

"I'd go back to school," I said finally, deciding the silence was worse than whatever ridicule Jaime might throw at me.

"Crazy," he said, his heart not really in it.

"I mean a good school," I added quickly. "Or I'd give a bunch of money to make ICSS good, then go back there."

He shook his head. "Waste it on a bunch of junior pinchheads. Let some scarface boss you around."

"Why don't you tell me what you'd do, then?"

"I told you," he said. "I'd do whatever I wanted to."

Inside the NattCo building, Jaime pulls me toward a large, curved counter with a dozen receptionists, each sitting behind a computer monitor. Most of them are talking to people, but Jaime walks up to one who isn't busy and puts the bag with the Idea Rat on the counter.

"We've got business with I.R. Retrieval," he says.

The receptionist frowns. She asks our names and punches them on the keyboard in front of her. She looks at her screen, then back at us. Smiling now, she indicates a yellow line of tiles set into the floor. We follow them down several hallways to a small lobby with a single desk. A man behind the desk talks into a microphone on a rod curving from his ear to his mouth.

Jaime holds the bag conspicuously. "We've got business."

"Check in, please." The man pushes a button, and a small square in the

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wall next to us opens. The lighted indent of a handprint is inside the square. Jaime looks at the man, then puts his hand over the print. The light fades, and Jaime quickly pulls away. He frowns, looking at his fingertips. He opens and closes his hand a couple of times, then shrugs at me.

I put my hand in the print. As the light goes down, I feel a sensation like cool, sharp steel scraping just below my fingernails. I pull my hand out and take a look. A thin, pink line near the first knuckle of each finger is already starting to fade. The fingers tingle, slightly numb until I wiggle them.

"Have a seat." The man motions toward a small reception area. Jaime and I sit in huge, cushioned chairs that barely sink under our weight. I listen to the buzz of activity moving through the building until the receptionist looks over at us. "That hallway," he says, pointing to an opening behind his desk. "First door on the right."

The door is open, and we enter a room with a large, red table. At the far end of the table, a man with skin even darker than mine is smiling at us.

"Come in, men. Sit down." His voice is as smooth and featureless as a wet street. "My name is Calvin Natt."

"They don't exist," I said to Jaime one night about six months after we left school. We were lying in the dark again, this time in a basement room Jaime had found for us when the attic got too cold. The place always felt too closed-in for me, too dark. I went to sleep there feeling like I was in a coffin, wondering if I would wake up in the morning. Most nights I baited Jaime into conversation to buy an extra few minutes of wakefulness.

"Stop talking crap," he said.

"It's a pinchhead's daydream," I told him. "Who's ever caught one?"

In the small room, Jaime's voice was like a whisper in my ear. "I was six when my mother left me," he said. Then he was quiet. I didn't say anything, because I didn't know what to say. He had never mentioned his mother to me.

"When she put me to bed at night," he continued after a while, "she used to sing that song about buying a mockingbird. You know the one I mean?"

"Yeah." Most of the sound got stuck in my throat.

"She used to carry for dealers, even though she hated pinchheads, despised them for not having control over something as basic as their own lives. She did anything to keep us fed, but she was always home with me at night. She used to call me her special night-time man.

"Usually, she came home with something canned. Sometimes she'd sucker someone too far gone out of a cut of fresh meat. I don't remember ever being hungry while she was still around. One day, she dumped her bag, and a rat fell out on the floor. She had gotten it as payment from the pinchhead she delivered to. She was supposed to take it back to the dealer, but she brought it home for me instead.

"I had never seen a whole rat like that, before it was butchered. I started to cry, but my mother laughed and hugged me. She let me sit on her lap

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and touch it. Its fur was soft, oily; the skin on its tail and legs felt like a sidewalk.

"When I asked my mother about the funny mark on its foot, she started to shake. She counted toes. She put the rat back in her bag and got ready to leave again. She told me to be good while she was gone. Said she might be late, so I should put myself to bed that night. She kept apologizing for that, promising that when she came back for me our lives would be wonderful."

The room was quiet again. The blackness reminded me of Jaime's eyes. I heard the muffled sound of a bottle breaking somewhere above us.

"I stayed up as long as I could, but she didn't come back. Next morning, I went to a neighbor who sometimes looked after me. She let me spend a few days; then she pawned me off on a friend of hers. I got passed around like that for a couple of months, until I realized I didn't need them. I could find better food and better places to stay on my own. After that, I stayed alone. I tried a different school every year, figuring I'd eventually find one that could make me smart enough to come up with a plan."

In the silence that followed, I waited for Jaime to say more, but I guess he figured I knew the rest of the story. He let me fill in the gaps in that dark coffin of a room.

Jaime puts the bag on the table and sits in a large, blue chair across from Calvin Natt. I sit down, too. Calvin Natt hasn't stopped smiling since we walked through the door.

"We've got something you might want back," says Jaime.

Calvin Natt raises an eyebrow, nods at the bag. "You've found an Idea Rat?"

"Yes, sir," I tell him.

"Congratulations." Natt says this as if mildly amused.

"We came to work a deal," says Jaime.

Calvin Natt's happy eyes stay on me. "What do you suppose one of those things is worth?"

"We want more than money," Jaime says.

"I didn't offer any money."

I look at Jaime, wondering what he's going to say next. He licks his lips with a slow, dry tongue and gives Calvin Natt a little smile of his own. Smiling is not something Jaime has practiced often. "Five years ago, a woman came in here."

"Your mother," says smiling Calvin Natt. "She'll be happy to see you."

Calvin Natt talks as he leads us through the endless expanse of building to Jaime's mother.

"When we picked up that you were checking out Idea Rats on various network sources," he tells us, "we sent someone to find your test scores. Outstanding. Unfortunately, by the time we got there, you were already gone. I've been trying to get the testing companies to waive the database fees for places like ICSS for years. That you two could exist right under our noses is just more proof that I'm right."

I glance over at Jaime. He looks small in the huge, colorless corridors. The bag containing the Idea Rat

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swings at his thigh.

"Forget your research, by the way," says Calvin Natt. "Forget what you think you know about me, even. Who I am depends on your domain extension. For city kids, I'm from the streets. In the suburbs, I'm a misunderstood genius runaway. Near the borders, I'm an illegal who made it good."

"You never caught an Idea Rat?" I ask him.

Calvin Natt smiles and shakes his head. "Nobody catches an Idea Rat."

"We did," Jaime says. He clutches his durafab bag for reassurance. "My mom had one."

"You caught a Bait Rat, genetically programmed as a sort of final test for potential candidates. Your mother was a fortunate accident. We were going for a dealer whose street-smart reputation intrigued us. I was more surprised than anyone when her scan turned up positive."

We reach the end of the corridor, and Calvin Natt puts a security card into a slot. An elevator door opens and we walk inside. Calvin Natt puts his card into another slot and punches a button. A feeling of extra weight tells me we're going up.

"The privatization of schools was supposed to make education more competitive, and thus more effective," Calvin Natt continues. "It didn't. The abolition of patent protection was misguidedly proposed as a way to achieve wider creativity. It wasn't. We're falling behind the world because we've stopped coming up with the breakthroughs, ideas that take a science or an industry ahead a couple of generations in one step. Ideas that come from geniuses. I.R.'s are NattCo's unique solution to the genius problem."

The elevator stops and the door opens into a small room. The wall across from us has another door, with a sign proclaiming "TOP SECURITY ACCESS ONLY!" in large, red letters. Calvin Natt puts his card in a slot and the door opens into a nondescript white corridor. The door closes behind us with a noise like air escaping from a tire.

"Twenty years ago, I was working for another company—mapping the human genome—when I found a unique sequence. Our map was effectively complete by that point. This sequence hadn't shown up in any of the millions already in Genbank, so I figured it was superfluous. Most of the DNA molecule is. Turns out this little sequence is transcribed just like a real gene, though we still don't know how. On a lark, I did a run on some Stephen Hawking tissue and found the same sequence in the same spot. Just for fun, I ran a check through my famous people files. Einstein matched. Lenin came up negative. Watson was negative; Crick positive. Go figure."

Calvin Natt opens a heavy door and we walk into a large laboratory. A woman in a pale blue lab coat is pulling a needle from the thigh of a man sitting in a metal chair. The man grimaces as the needle comes out.

"How's it going, Mary?" Calvin Natt asks. "Bill?"

"Fine, Mr. Natt." The woman takes the syringe over to a counter, turning

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her back to us. The man shrugs, grunting in a way that could mean anything.

"Idea Rats are created using a particular genius sponsor, like Bill," Calvin Natt continues. "Mary isolates sequences and sends them down to embryology, where they will be spliced into the chromosomes of our Experience Animals. Are they doing hawks this week, Mary?"

"Dolphins, I think," she says without turning from her work.

"We've got high hopes for dolphins," Calvin Natt says as he leads us from the lab. "Most of the world is under water, after all."

He leads us down the empty corridor. "When I first isolated the genius sequence, I tested thousands of people, myself included. I didn't find a single match. I made a standard request for more funding to research the matter further. To my surprise, the company approved a study including all employees. It turned up one match, a janitor with a tested IQ at the lower end of average. I went to the chemical-psychology division, to a doctor working on the genius problem from a different angle. She could get her subjects to a certain level, but nobody ever went beyond a clear-cut upper limit. Within six months of running that janitor through her program, though, he came up with the groundwork for the entire I.R. concept."

We go through another door, into a room with a large window overlooking another room. In that room are a half a dozen desks. At each desk, a person sits in front of a monitor while text and diagrams flash by on the screen. The people watch with nearly frantic expressions on their faces, as if desperate to take in everything they see.

"Despite popular misconceptions, we first developed Pinch as a means to speed the learning process of our genius candidates," Calvin Natt tells us. "It was one of our competitors that realized the dubious potential of selling it on the streets."

I try to identify something in the blur of images on one of the screens, but it's impossible. "With proper dosage, Pinch can enhance learning times by over 200 percent," says Calvin Natt. "More than anything, genius is the ability to make connections between seemingly unrelated things. The wider variety of knowledge a person has, the better the chance that some connection will be made, given the proper stimulus."

We leave the observation room through a different door, walking into a hallway with plants and paintings and other superficial decorator touches. The wooden doors in this hallway are less widely spaced.

"The nature of genius is to make unpredictable connections. We can't just feed a set routine of stimuli to someone with the genius gene and hope he comes up with something new. Who knows what insight will finally kick a genius over into a breakthrough discovery? Our experience animals let us safely expose our geniuses to as many different stimuli as possible. Here we are."

We stop at a door that looks like every other we've passed. Calvin Natt knocks, then puts his card into a slot. The room we enter is twice as large as

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any place I've ever lived, and doors on each of the walls tell me there are other rooms beyond this one. The carpet pushes back on my feet as I walk.

Sitting in a chair at the center of the room is a small woman with short-cropped dark hair. Her features are sharp, nearly rodent-like. She stares straight at us, and I notice her eyes, so dark they seem black, with a tiny glint of hidden intelligence not quite held back. Suddenly she jerks, her expression one of strange, detached terror. She moves a little, and I see the wires hanging from the back of her head.

"She's running the experiences of her latest E.A." Calvin Natt smiles at her proudly. "She'll be through in a couple of minutes."

Jaime stands frozen. "What have you done to her?"

"You should be very proud," says Calvin Natt. "In the time she's been with us, she's come up with five genius breakthroughs, not including two symphonies which some music critics are calling the wave of the future. Her spent-fuel disposal program may be effective enough to get a steady energy supply back to the inner cities. With proper funding, her suggestions for the maglev system will mean a huge expansion in public transportation options."

"What are the wires?" Jaime has spent years practicing his self-control. So little anger seeps into his voice that Calvin Natt doesn't even notice.

"When an E.A. returns, all of its experiences are scanned. These impressions are encoded into software that can be transferred directly into the mind of the genius whose gene was originally used in the creation of that particular E.A. All of the experiences of the E.A. effectively become the experiences of the genius."

I look at Jaime's mother. She squirms in her chair and lets out a small squeak.

"Why?" I ask Calvin Natt.

He looks surprised at the question. "Through this process, one woman has produced more breakthroughs in five years than all of humanity might have given us in a century. How can anyone who has lived where you have doubt the need for breakthroughs right now?"

Jaime's mother makes a loud, high-pitched noise, like a baby either crying or laughing. She reaches up and pulls the wires from her head with a grimace. Then she blinks a couple of times and notices us.

"We finally found him," Calvin Natt tells her.

She looks at Jaime with eyes dull as a rat's. Then the eyes open wide and her mouth moves soundlessly as she tries to say something. "Jaime?" she finally croaks out.

Whatever has kept Jaime stuck in place lets him go. He runs to her chair, and her thin arms wrap around him. "My night-time man," she says. "Oh, my special night-time man."

Calvin Natt smiles proudly at the reunion. We watch the two of them for a few seconds, then he motions me toward the door.

"We look forward to having you here," he tells me in the hallway.

"What?"

"The genius gene is incredibly rare. So far we've discovered it in only a

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couple of dozen people. Of course, our hands are tied by the Barker Act. Maybe you'll come up with the breakthrough that will let us identify more people like you without further risk of public exposure."

I remember the tingling in my fingers when my hand was on the sensor. I look down, but the pink lines have disappeared.

"It will take about six months before the first Experience Animals with your genetic imprint can be grown and sent out," Calvin Natt says. "In the meantime, we need to catch you up on your schoolwork." He frowns, shaking his head. "If districts like ICSS don't validate a need for the work we're doing here, I don't know what does."

I nod my head but it doesn't mean anything. I've caught up with the thing I was chasing, only to find I don't really know what it is.

Jaime comes out of his mother's room. His eyes have a red-rimmed, after-crying look, but his voice is steady. He still holds the bag containing the Idea Rat, gripped so tightly his fingers are white.

"What happens now?" he asks.

Calvin Natt smiles, of course. "Now, you're part of our team."

Jaime stands next to me, his shoulder touching mine. "We need to get our things," he says. "There's some stuff hidden in a place we've got booby-trapped."

"We have what you need here." Calvin Natt looks at us like a man who has been through this conversation many times before.

Jaime looks at me. "What if we say no?" I tense a little, seeing now how it's going to be.

Calvin Natt gives Jaime a puzzled look. "What do you have to go back to?"

Then Jaime does something I've never seen him do before. He releases a long breath and lets his shoulders slouch forward in defeat. "Maybe you should take us where we're going, then."

Calvin Natt smiles again and turns to lead us down the hallway. Jaime swings his bag, connecting hard at the wide place between Calvin Natt's shoulder blades. Natt falls forward, knees hitting first, upper body following. The dull thump his face makes as it connects with the floor and the muffled *whoof* of air escaping his lungs are the only sounds that come from him.

Jaime strikes Natt's body again, so hard that a hole pops open in his bag. At the third blow, the stiff, broken Idea Rat comes flying out. Jaime stands over Calvin Natt, breathing hard. When he finally looks up at me, his face is expressionless.

"You coming?" he asks me.

I imagine Bill's grimace, the dazed expression of the people in front of their monitors, the not-quite-human squeal that came from Jaime's mother.

Calvin Natt rolls over just enough for Jaime to take his security card. He groans softly as I jump over him and follow Jaime.

Natt's card in hand, Jaime leads us through a maze of hallways that all look alike to me. When we leave the Top Security area, we start to pass more and more people. A few give us

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strange looks, but nobody tries to stop us. They are busy going about their own jobs.

We are on the ground floor when the alarm goes off. As we run past the small reception area, the man behind the desk stands and says something into his microphone. By the time we have followed the yellow tiles back to the main lobby, NattCo policemen are moving into place. A few dozen people who have no idea what's going on help to slow down the cops, but there's only one way out, so all of the uniforms are moving toward the revolving door.

One cop has already taken up a position in front of the door. His hand on the holster holding his stun gun, he stands wide-legged, confident. I move to the left, while Jaime drifts slightly right, but the cop holds his position, knowing he needs to slow us for only a couple of seconds to allow the others to arrive in time to take us.

Jaime slows down, trying to figure an angle that doesn't exist. My first instinct is to do the same, but in less than the time it takes me to put one foot down and lift the other, what I have to do comes to me. It is a moment that reminds me of difficult test questions back in school, when a sudden answer would pop into my head. Rarely even close to an answer I expected, its correctness was always so apparent that I never hesitated to follow my instincts and write it down.

I bolt ahead of Jaime, straight for the cop. He pulls out his stun gun to keep me from getting around him, but he has misread my intentions. I run into him as hard as I can. Streaks of light flash inside my head as I hit him. I wrap my arms and legs around him as we fall. He struggles to get up, but I'm dead weight and he has no leverage.

Jaime runs past, through the revolving doors, back into the city. A few cops follow half-heartedly, knowing they're already too late. He will lose himself again in the dance of the people he despises, the losers and castoffs without hope that their lives might ever get better.

As the cop struggles beneath me, I think of those people. Surely, there must be some breakthrough that can help them. Some moment of unexpected insight from someone, somewhere, that will change things for them.

I wonder what it will feel like as some Idea Rat's experiences seep into my mind. I hope it's like those times with the difficult test questions. I would chase the solution half a dozen different ways. Then, sometimes even after I had given up and gone on to another question, the answer would be there, full-blown and obvious in my head. I used to love those moments, that feeling that something had crawled out from a place hidden inside of me.

Maybe chasing the Idea Rat has led me to a life full of such moments. ■

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J.R. Dunn

OUR SHARE OF DARKNESS

The faithful have usually left the details of theology to the professionals—and for some, technology is a new religion. . . .

Illustration by Janet Aulisio

Inside the room the hospital sounds faded. Dad lay unmoving, in appearance already a corpse. Two weeks since the stroke had hit him, and the sight of him still shook me to the core.

I went to the headboard monitor and ran a check. A ritual; the most I could do for him. Everything was nominal, as I'd expected. Any change would have triggered alarms at appropriate terminals. It was a good system. Not cutting-edge, but it did the job. I should know—I'd installed it.

This close, I could hear his breathing; impossibly light, a faint whistle at

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the bare edge of hearing. There was a pause—I gritted my teeth, but the slow rasp resumed a moment later.

Backing away, I found a chair. At first I thought the deathwatch would be a torment. But it wasn't that bad. Sitting there as the memories rolled by, things I'd forgotten years before. The racquetball that he loved but wasn't very good at. The way he'd laughed when I lost control of an ice cream cone and wound up with most of it in my lap—Christ, that had to be one of my earliest memories. The first time he'd taken the casing off a computer to show me what was inside, saying that you could put a whole world in there.

Old fool, I thought. You could not. Nothing that mattered would fit inside a machine.

I became aware of a presence behind me. In the hall stood Randy Coover, holding his workcase before him like a shield. As my eyes fell on him he made a move, as if about to bolt. I sighed and got to my feet.

Randy greeted me with a shake of his head. "Hard to believe."

"It comes. You know that." I'd attended his old man's funeral three years before.

"But I talked to him just last month. It's like it's not the same man."

There was a catch in my throat that I couldn't force an answer past. Randy's dad had gone quickly—a heart attack during a fishing trip upstate. Dead before the med lifter reached him. "Yeah," I managed to choke out.

Almost furtively, Randy glanced

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over his shoulder. I smiled, knowing who he must be looking for. "Chloe coming around?"

"Uhh . . . yeah. She . . . did tell me to meet her here."

"Business?" I could sense that my voice was a little too loud.

He grimaced. "Alex, don't put me on the spot. . . . "

"Me put you where?"

The lawyer in him suddenly emerged. "Alex, she's a cli—"

"So she's your client. Big deal. She's my sister. I know what she's up to." I waved at the open door. "She wants to dupe him. Put him on disc. So she can take him shopping with her, I suppose. That's what you're here for, counselor."

He went rigid, still in attorney-at-law mode. Or almost—there was something in his eyes that wasn't law school issue. "I'm her lawyer, Alex," he said, as if ashamed of the fact.

I gave him a disgusted look. "Come off it, Randy. If she wanted to bring in a channeler, you'd handle that too? Same with duping. You don't know cybernetics, and I do. There isn't enough memory on the planet to—"

Randy's workcase buzzed. He fumbled with the receiver. "Hello?" His eyes widened and he made to swing away. Smirking, I crossed my arms.

"Oh, hi . . . yeah, I'm at the hospital." His gaze flickered, then he straightened up and looked right through me. "No," he said quietly. "No, he's not here."

I dropped my head, feeling a touch of shame myself. Randy was right. I had no business snapping at him. It wasn't his fault.

"You're on your way," Randy said flatly. I touched his shoulder as I slipped past. "I'll see you," I whispered.

"Alex," he called out before I'd taken more than a few steps. I turned. He had a palm over the receiver. "I do feel sorry about your dad," he said, each word distinct.

"Thanks, Randy." I went on my way.

I had to wait for the elevator. As I stepped out, I saw Chloe crossing the lobby with two men I didn't know. Hard to miss her, in her silk Chinoise-style suit and broad-brimmed hat, the fashion triumph from Shanghai this season. It made me wonder if all the sleek-looking women you saw were as screwed up.

My stomach twisted at the sight of her. The last time we'd talked had been a knock-down, drag-out brawl, and I wanted no rematch. Seeing an office next to the elevator bank, I ducked inside. Heels clicked on the hallway tile, Chloe's voice ringing out high and shrill: " . . . he moved yesterday. He heard me. He knew it was. . . . "

Stop it, I wanted to tell her. He didn't hear anything. He'd never hear anything again.

Then she was past, her steps eager, as if she was going to meet a lover. The two men followed. One of them smirked at the other.

"Now, when we meet my brother, you—" Chloe's voice cut off. Behind me a throat was cleared. A woman behind a counter frowned at me. "Can I help you?"

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I felt my face redden. "Uh, I guess not."

Leaving the building, I whistled for my car. As I got in the hospital system began paging me.

I spent the rest of the day brooding behind the desk that had once been Dad's. I knew I wasn't handling it well, but there was no such category where Chloe was concerned. Rhea might have done better, but she was beaucoup million miles away, en route to a place called "Sears."

Somebody once said that happy families are all alike, while unhappy ones differ. I don't know if that's true. It seems to me that all families vary in their levels of joy and misery, depending on time and circumstance. Maybe in some ideal sense the words are valid, but who lives an ideal?

We were a happy family, more so than most. Looking back, I could see that clearly. No matter what happened, that deep sense of rightness never failed us. Except where Chloe was concerned.

Our happiness was based on what Mom and Dad had. They were soul mates, closer than any other couple I've ever known. I hadn't understood that until I got older and saw what other marriages were like. They were among the luckiest in this bitter world, and they passed their luck on to us. We basked in it, Rhea and I, scarcely aware of its source, taking it as our due, which of course it was.

But not little sister. And that, I think, is where the adage fails. Chloe should have been happy. Why she wasn't I can't explain and I doubt that anyone could. What for Rhea and me was the basis of our lives, she took as an insult. She was Daddy's girl, and Mom stood between her and her rightful place. The dynamics of the thing were obvious, and it was sickening to watch, particularly as she got older—the tantrums, the sulking, the unending nastiness.

Mom never complained, saying that Chloe would grow out of it eventually. As for Dad—he had a weak spot for her, but he managed to control it, most of the time.

But she never did grow out of it, and when Mom died, I saw that she never would.

Chloe said nothing about Mom at the funeral. No need—she'd won, you see. Her great rival was gone, and Dad was hers alone now. All her attention was focused on him. I watched her traipsing around him, acting half her age, solicitously gripping his arm during the ceremony. All the time unaware that she was addressing a shell, that he wasn't really there anymore, that his heart slept with his wife.

A week passed before the truth hit her. She cornered Rhea and me in the kitchen of the old house where we were staying. Daddy wouldn't talk to her, he sat staring into space, she didn't understand. . . .

"He's fading away," Rhea told her. "People do that, Chloe. When they're like him and Mom."

Chloe stared at Rhea as if she'd grown horns. "Fading . . . what are you *talking* about?"

It took an hour to pound it into her head, and I'd rather be flogged than endure that again. Chloe wailing

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aloud, hands over her ears, sobbing as if we were murdering the old man before her eyes. "I don't want him to fade away," she cried, spittle dripping from her open mouth. Finally she ran off, leaving Rhea and me eyeing each other.

I didn't see her the next day—I was out wrapping up some legal matters remaining from Mom's death. When I got back it was dark. I went upstairs, and as I passed Dad's room I heard her: don't leave me. I can't go on. It's too hard.

I stopped, chilled to the bone, wondering what to do, whether I should step in, where Rhea was. Then Dad spoke, his voice low and soothing. I left it at that.

She pulled it off. I've got to hand it to her; she brought him back. Oh, not all the way. He was withdrawn, with no interest in the business, his hobbies and books gathering dust. At times he sat for hours saying nothing, and when he spoke it was only of days long past. But he was there for her. And the damnedest thing is, she didn't see him any more often than she had before. Called him regularly, visited him every few weeks, no more than that. Go figure.

Now the matter was beyond argument. Even she couldn't revive him. So she'd pulled out her hole card: she wanted to dupe him, copy his mind onto cold circuitry, run the ghosts of his thoughts through microchips. Keep him by her forever.

She'd brought it up once before, when the technology—to stretch a term—first appeared, bombarding Dad with brochures, articles, newsgroup printouts. Dad humored her for awhile before finally putting his foot down, the most lively I saw him during the whole decade. Chloe went off to sulk, and it was never mentioned again.

Until last week, when she told me that she'd "arranged" for a dupe to be made. No big deal, only thought she'd mention it, and oh, she happened to have the authorization form right here. . . .

I told her no. The same as Dad had—no discussion, no debate. A waste of time explaining that the procedure was a fraud, the recording of a few high-level behavioral patterns and no more. She could understand that as well as a Cro-Magnon could grasp fusion power. She knew it worked, she'd seen it on the tube, the boxes really talked!

No more could I tell her the real reason: what Dad told me late one night as we sat together on the porch. That he was lonely, that he missed Mom so much, that he could feel her near him at times when he couldn't sleep. That this transcription business might prevent him from joining her, from going home. . . .

I didn't dare bring that up. So I simply recited the provision of the will, the latest version, prepared last year, and hit the ground running.

I hadn't heard from her since, and I'd been hoping I wouldn't. But Chloe didn't give up that easily. You could say she never gave up at all.

Clearing my mind, I got down to work. Despite everything, there was a company to run. Dad's company—I

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still thought of it that way, after all these years.

Every couple of hours my genie announced that Chloe was calling.

I got home late. The house was silent, Monica and the kids asleep. Too keyed up for rest myself, I went to the back room and poured a scotch.

The phone showed thirty messages. That puzzled me until I ran a preview and saw that they were condolence calls. The news about Dad must have gone out over the Net.

I decided to run them. It was a fine break from the strain I'd been under: sipping my drink with the screen glowing in darkness, sinking into a sweet melancholy as others sang my father's praises.

The third call was from Chloe. I erased it and, after a moment's thought, went through the rest. I caught two more Chloe bulletins, and what do you know: Randy, looking hangdog. "Alex, could you call me as soon as possible? It's important, thanks."

"Delete," I said.

Satisfied, I ran the others. Amazing how many people Dad knew: a professor from Straits University in Singapore, a cop he'd worked with during the Big Fear, a young woman who'd taken his virtual course after he retired from business.

I was feeling drowsy when another face appeared. Older man, square-jawed, white mane combed straight back from his forehead. His skin was pale, not in a sickly way but as if a diffuse light was shining through it. I didn't like his looks. But he seemed familiar, and I tried to place him as he began to speak.

"Hello, Alex." The voice was low and firm, with a sense of bridled emotion underlying it. "I know you're enduring a hard time, one of the hardest of all. And I don't mean to intrude."

I stiffened, realizing what the call was, what *he* was. No wonder he looked familiar—he was a virtual construct. And this was an ad, a pitch.

"But what I have to say is important. To you, to your family . . . " A pause, a slight catch. "And to your Dad."

The voice was Reagan's, the eyes Kennedy's. The jawline was taken from some anchorman dead before I was born, the pallid skin adapted from a thousand years of saint's icons. A "trusted uncle," this version was called.

" . . . No longer is it necessary to simply say good-bye, to watch that beloved spirit slip away. . . ."

I lunged forward, spilling what was left of my drink. That muted stained-glass glow to one side, the bright light over his head. Ancient religious symbols, derived from the operation of consciousness itself, their meaning dropping away over the millennia until all that remained was soothing, empty imagery. A week's worth of anger and frustration surged within me.

" . . . To *be* there, to advise and help, to share your joys and sorrows as the years pass. . . . "

I studied the play of expression, image and voice. It looked pretty damn fake once you knew what it was.

" . . . I hope I've . . . eased your burden somewhat, Alex. Think about

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what I've said. So much is at stake. I'll be here if you wish to discuss it." The image gave me a brave smile. "Best wishes."

The picture faded to a call set-up display. God, but they were cocky! They'd hear from me all right. Transcrib companies weren't allowed to make cold calls. And come to think of it, I hadn't seen an advertisement slug either.

I bent over the keyboard. Give their lawyers a sleepless night, then call Chloe, let her know what kind of outfit she was . . .

The command died on my lips. . . . *she was dealing with*. Of course—the company hadn't broken any laws. She'd given permission.

I got to my feet, head whirling with fury. The call-back symbol blinked at me. "Delete," I whispered. Another face appeared, earnest and sad. What now—an undertaker, a florist? "Hold—no, off."

The room was too small for what I was feeling. I kicked at the door when it didn't fold open fast enough, then glanced guiltily up the stairs. I didn't want to wake Monica. She'd been awfully good, on the spot whenever I needed her. That meant something in her case. Her parents had been killed during the Big Fear. She was terrified of death, more so than anyone else I knew. With one exception.

So I went out, hoping a walk would cool me off. It did, immediately and literally—a cold night for this late in the spring. All the same I pushed on, down the hill and past the police kiosk at the intersection. The cop waved as I went by.

I turned onto Yale, a quiet side street. A lighting plasmoid dogged my steps, casting a black shadow before me, ready to flash red if I ran into trouble. But I was looking for darkness and solitude. A vacant lot lay ahead; I cut over to it. Behind me the plasmoid bobbed uncertainly then drifted back to station.

I crossed the lot, shoes sinking into damp soil, mind filled with visions of Chloe falling under a bus, Chloe in front of a firing squad, Chloe dangling over a cage of starving Dobermans. Old images, and not mine alone. Once Rhea and I had sat for an hour in the backyard, thinking up novel finales while the victim glared from the porch, certain that we were talking about her but damned if she'd pay any attention.

Kicking at the odd bush in my path, I reached the center of the field, marked by the shapeless remains of a fireplace. I sat on the cold brick. A house had stood there, burned down during the Big Fear. Somebody taking advantage of the disorder for a bit of personal vengeance, I suppose.

Thoughts of Chloe vanished. The Big Fear had probably been Dad's finest moment. That bizarre, inexplicable week when panic had gripped the nation by the throat. Forty years of paranoia, demagoguery, and media manipulation come home to roost. Half the country convinced that some unidentified "they" was preparing to bring down the Apocalypse. Black, white, Jewish, Latino—didn't matter; whatever you were, somebody somewhere somehow was out to get you.

They say that the net sentries had

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nothing to do with how it had all fizzled out. I'd like to hear a better explanation.

Certainly nobody else did anything constructive. The cops barricaded themselves in their stations. The National Guard deserted en masse. The White House responded with timid press releases that only kicked the uproar to a higher level.

I was four at the time, and didn't really understand what was happening. Something—maybe the torching of this very house—had prompted me to slip downstairs late one night, to Dad's computer room. The Playroom, Mom called it.

He sat unshaven, shirt open, keying away at his comp. "Hey, sport," he said when he saw me. "Can't sleep?"

I mumbled something, unwilling to admit I was afraid, finally asking if the rioters (as if I knew what a rioter was) were coming. He chuckled, set me on his lap, and pointed to the screen, telling me who he was in contact with, what they were doing. Diamond Dog in Frisco, Carrie Lee in Mobile, Karim V in Detroit—hundreds of them, connected by silicon and cable, throwing in their weight where the rest of society had broken. Organizing neighborhood patrols, knocking on doors to reassure people, pulling the more hysterical news anchors off the air, coaxing the cops out of their fortresses.

He must have realized that—smart kid that I was—I could sense a difference between the real world and the virtual. Lifting me up, he carried me out to the porch. "Quiet night," he said as we descended the steps, and it was quiet, and dark—most of the power was down at that point. He took me to the street. At the curb he swung slowly around, the shifting of his feet the only thing that broke the stillness. "No rioters around here."

His eyes lifted to the sky, the stars piercingly clear in the absence of man-made light. Throwing his head back, he pointed at them. "See that, Alex? That's the biggest thing there is. Bigger than it looks. But I'll tell you something: we know what it is. All of it. We can touch it, too. There are people out there right now." He paused as I followed his gaze, as my world cracked wide and leapt outward, as I realized that he wasn't talking about only the stars, but what lay beyond them, and what lay beyond that in turn.

"Someday, we'll take hold of it all. And if we can do that, kiddo, we can handle anything. So don't worry about rioters. They're nothing much."

We lingered a moment or two before going inside. At the door to the back room, he stiffened at the sight of the monitor, then set me down and darted toward it. A long sigh escaped him. "St. Louis is back on-line," he whispered, then reached out to tickle me beneath the ribs. "We're winning, kiddo!"

And I lay down in the easy chair in the corner, and fell asleep watching my father, and a thousand others, save the sum of things.

That's what I should be thinking about now, I told the blurred stars overhead. Not how to outwit my neurotic little sister.

The cold was beginning to bite, so

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I headed back to the house. Monica was waiting for me, hair mussed, a wry look on her face. It took me only a second to grasp what it meant.

"Chloe called."

Monica nodded wearily. I slumped against the wall.

"Hey," she said, wrapping her arms around me. "Want me to take care of it?"

I was sorely tempted. After we got married Monica had put Chloe in her place real quick in some way I'd never understood. One thing I could be sure of was that she wouldn't dare show her face here.

I shook my head. "Not even you, babe."

"Well, in that case, you'll need your rest. You can be damn sure she's sleeping easy. So come on up."

My tired brain settled on something. "In a minute."

"You're not calling her *back?*"

"No way." I went to the study. "Search," I told the system. It signaled READY. "Copy everything available on transcription, minus the crap." The system knew what my definition of crap was.

I left the unit clicking and humming behind me. Monica was waiting when I reached the stairs.

There was no change the next day. I wasn't surprised. There would only be one more change coming for him, ever.

I had a horror that it might happen when I wasn't there. It wouldn't matter to him; he'd said his good-byes. But it meant something to me.

I wondered if Chloe felt the same, or if he was only a husk to her, with the real Philip Markham hovering somewhere in the ozone, waiting to be retrieved.

Who gave a damn what Chloe thought? She barely grasped the logic of her own position. Kept throwing the "Turin hypothesis" at me, as if it had been named for the city, as if the Shroud had something to do with it. Which, in her mind, could well be the case. When I asked her what the hypothesis stated, she said, well, if it sounds like somebody, it *is* somebody. Thus promoting tape recorders to human status.

I'd never been impressed by Turing's thinking. Who was asking the questions—Bertrand Russell or JoJo the Dog-faced Boy? And who was answering? Turing—and Moravec, and Minsky—had been clever but not deep. They hadn't foreseen that the idea would be taken up by the vultures, eager to make a buck off of human misery. Recording a cartoon of the original personality, selling it as the soul, the essence. At twenty-five grand a pop.

But to Chloe it wasn't a cybernetic Ouija board at all. No, it was *science,* it had to be true. Why, Daddy could be downloaded into a new body someday, good as this one, even better. Who was I to cheat him of that? She was going to do it. She'd be walking the Earth long after I was dust.

It had cost me not to laugh. The picture of Chloe as an immortal superwoman had its comic aspects.

I just couldn't stop picking at it, couldn't leave it alone. A shameful thought occurred to me when I looked back at Dad: why didn't he

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just let go, save me this trouble? Why hang on?

Nothing remained aside from the waiting. Go on, old man. Go to your dear one, in the world beyond the world. There's nothing left to do here.

I needed a break. Stepping out in the hall, I paused to stretch.

"Well, hello there."

I turned to see two men approaching. At first I didn't recognize them, then I remembered: they'd been with Chloe yesterday. I looked between them as they came forward, smiling at nothing. So these were the noble transcrib techs—though techs probably wasn't the proper word. I'd spent my life around cybernetics people, and this pair didn't fit the mold.

"Mr. Markham," the taller one said. "Glad we ran into you."

Ran into me, bull—they'd been leaning against the wall, waiting.

"We just concluded a procedure in the other wing and learned you were in the building," the second one said.

I was about to ask exactly how they'd learned that when the tall one reached into his jacket and pulled out a brochure. He handed it to me. "We thought, if you were free, that perhaps we could initiate orientation."

It was a holo brochure, expensive and flashy. No company name anywhere that I could see. I flipped it open. A picture formed: Chloe and me, in stiff, generic poses, against a hazy background. Between us stood Dad, a grotesque smile on his face.

I raised my head. "Orientation?"

"That's right. We like to delineate the process, allay people's concerns—"

"My sister's been oriented already? Went well, did it?"

He paused, smile fading. "Why, yes—"

"That's why you were laughing at her yesterday?"

"Excuse me." It was the PA. *"Would you lower your voices, please?"*

"Steve," the short one said, "maybe we should wait for counselor Reynolds—"

"That's what you were doing—laughing." I waved the brochure. The picture flickered on and off. "Joke a minute in your business, no?"

"Gentlemen, this is a hosp—"

"Now look here, sir—"

"No, *you* look." Snapping the holo crystal, I felt a flash of pain as broken glass cut my thumb. I bounced the brochure off his chest. "See that, you fucking vampire?"

He fell back, his eyes wide. The other one grabbed my shoulder. I brushed away his arm and swung toward him.

"Hey," somebody shouted.

"Now mister, wait—" The short man backed into the wall. He glanced at his partner. "Steve—!"

"What's the problem here?"

A big man in white frowned at me, another nurse, a woman, right behind him. I swept an arm at the pair. "I want these *motherfuckers* out of this hospital."

"Excuse me, sir," the female nurse said. "That kind of talk isn't—" The man lifted a hand to shush her. "Let me get this straight, Mister—"

"I want them gone," I shouted. "Now! Fucking pimps—"

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The woman turned away. "I'll call security—"

"Hold it, Peg." The man drew her close and whispered something. She frowned at him but then nodded and stepped aside.

The man came toward me. "Mister Markham," he said quietly. "Seems we got a comm glitch of some sort here."

I felt my skin redden as I realized what kind of spectacle I'd made of myself. "I want those . . . leeches kept away from my father."

"Got you," the nurse said. "Up to me, they wouldn't be hanging around at all. But—" His square face grew quizzical. "Your sister seems to think you're going through with it."

"No way."

He grunted to himself. I noticed he was wearing a sunburst cross earring. A Reform Catholic—they considered transcription to be a mockery of God's will.

"I wondered, knowing you're a computer man and all," he went on. "But she's already arranged for system backup." He bit his lip. "You talk this over with her? None of my business, you understand."

"Sometimes talking's not enough."

"Clear," he said. "Well, since they're with her, I can't give 'em the boot, but, uhh . . . a little pressure won't hurt."

"I'd appreciate it."

"And about your sister . . . " He paused. "I was here when she had her trouble. . . . "

I had to think of what trouble he meant. It must have been the breakdown that forced her to quit college. Funny, he didn't look that old.

"You know, there's the chaplain, or the shrinks—" he ended with a shrug.

"Thanks," I said. "I'll keep it in mind."

"You do that. The Markhams done plenty for this place. We oughta return the favor."

I headed for the elevators. Behind me the nurse said, "How many times you gotta be told not to solicit on premises?" The techs began talking at once, a barrage of protest. The only thing I could gather was that Chloe would be pulling in any minute.

I walked on to the elevator. At the corner three people stood talking, a woman and two men. The woman's voice was high and throaty, as if she'd been crying. But all I had eyes for was what she was carrying.

It was a portable optical memory unit. A soul box. Not the usual black or gray—this one was a light pink. She clutched it protectively, as if holding a newborn child. I thought of a cartoon I'd seen: a man staring at a box just like it and saying, "Doesn't he look natural?"

The man she was speaking to was a caricature himself, a trusted uncle come to life. Same preacher's mane, pale complexion, a black suit and white turtleneck to heighten the resemblance to a priest.

The other man, evidently the husband, caught my gaze. He flushed and looked away. I went on into the elevator.

Outside I gave a whistle. I stepped off the curb as my car pulled up. Dad taught me that trick. I'd made a lot of spare cash in high school modifying the other kids' car systems. Common enough today, but back then it was a

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bitch tweaking the frequency recognition software. One time this big motorhead named Squeeg came around. He had a retrofitted '98 Mustang, and he wanted—

"Alex!"

Without pausing, I opened the door and got in. A moment later a white glove rapped at the passenger window. "Alex, wait."

I kept my head down. If I met her eyes, I'd get back out. I just knew it. We'd fight, right here, in public. I'd deck her, I swear to God—

"First," I said, gripping the wheel. The rapping grew frantic. Unwillingly, as if under compulsion, I turned.

Chloe stared at me beseechingly, both gloves up. One was holding a transcrib brochure.

I lifted my hand, whether to wave her away or strike at her I don't know. Then the car was moving. A guy about to cross to the lot leapt back. He shouted something as I passed. I didn't look in the mirror.

I had a mild buzz on when I got home. I'd stopped at the club for a couple of drinks. The guys at the bar were all real sympathetic.

The house system told me that Monica had gone food shopping. Funny that remote ordering had never caught on; people like to get out and around.

The monitor displayed no less than fifty-three calls. I shook my head. I couldn't bear going through them tonight. But two were marked URGENT, one local and another ultra-long distance. I could well guess who they were from.

But the first was a surprise—Randy, glum and lawyerly. "Alexander Markham." He glanced to one side. "April 21, 3:58 P.M. This is to notify you that my client, Chloe Markham-Lee. . . . "

Randy's face screwed up. "Markham-*Eliot,* has instituted legal proceedings concerning the possession of the psyche of your father. . . . "

The fax whined and a sheaf of papers emerged. Tearing them off, I tossed them on the desk.

"Ah, hell with it." Randy threw his arms wide. "She's on the warpath now, bro. I don't know what you did, but she wanted a restraining order to keep you out of the hospital. I convinced her that was a stupid idea. But this other thing . . . there's no reasoning with her."

He regarded me for a moment. "Can't you even talk to her? Your own sister? She wants somebody to hold her hand, for chrissake. I can't do it. It's not my place, and . . . " He snickered. "Not enough billing hours since time began worth that.

"Anyway, there's the paperwork. Look it over. I'll be in touch."

The screen blanked. I reached for the sheets. But why bother? There wasn't a judge in town who'd issue the kind of order Chloe wanted.

Instead I brought up the second call. The screen wavered and Big Sis appeared, floating in midair, legs folded underneath her.

"Alex? . . . Rhe," she said, as if afraid that I'd have trouble placing her. I opened my mouth to say "hi," clamped it shut in embarrassment.

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The time delay was something like seven or eight minutes.

Rhea's eyes narrowed. "It's about the Pest."

I nodded. I'd guessed that it would be.

"She called this morning. Can you believe it? Not a peep out of the little slug before I left, and *now* she gives me a ring. And get this: she called *live*. Actually paid a premium. How do you like that?"

I didn't. The space bug had missed me and Chloe, going straight from Dad to Rhea. But where I couldn't see the point of it, Chloe was flat-out hostile. She hadn't even gone down to see Rhea lift off.

"But I figured, it's about Dad, let bygones be bygones. I felt bad I didn't make the first move. And she sounded perfectly normal." Rhea sighed. "At first."

I shifted in the chair. Something wasn't right. Rhea was speaking far too calmly. She was never calm where Chloe was concerned.

"She starts with that download BS, how nice it would be, how much Dad deserves it, on and on. I was getting madder by the second. I really was." Rhea's voice grew confidential. "But the more she talked, the worse she got. Crying, doing that thing with her hands. By the time she finished she was in hysterics. It wasn't fake, either—you'll see on the recording. Hiccups, tears dripping off her face, and she just kept talking. It was creepy, Alex."

Somebody shot past Rhea, evidently brushing against her. She swung to one side, grabbing the console with both hands. "Sorry, Rhe," a voice called out. "Didn't know you were on the phone."

Rhea made a face at whoever it was and got herself settled.

"She was begging me. Not straight out, no. Circling around it. But—oh, you know how badly we get along. Think how much she must be hurting to go *that* far."

Throwing her head back, Rhea ran a hand through her hair. I knew that gesture. It was called: Big Sis Choosing the Higher Path. Not as dramatic as usual, with her hair cut to mission length, but effective all the same.

"I'm giving her permission, Alex. Running it through Houston—she'll get it tomorrow. I want you to know first. It . . . it's no big thing. Daddy won't know. Not really."

Her voice went higher. "I never saw her like that before. Look at the recording, you'll see. She's our *little sister*, Alex. We can't make her walk the plank."

Rhea's face softened. "I know you think I'm letting you down," she said. "I guess I am. But . . . don't be mad, huh?" She spoke another word that the mike didn't pick up. "Well—kiss Daddy good night for me."

I sat glaring at the dark screen. Don't be mad, Junior. Let bygones be bygones. We all have to stick together now. Easy for her to say, sitting where she was—

The monitor lit up again, revealing the Pest herself, wearing the same outfit I'd seen earlier. "Rhea?" she said in a helpless voice.

I got up and slapped the unit off. I didn't need any of that. Chloe

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turning on the waterworks—nothing new there. But what was Rhea's story? She'd never been taken in by that act before. Up in the Big Dark too long, that was her problem.

But no, it went deeper than that. As far back as I could recall, whenever Rhea was reluctant to face something, plop it went into Alex's lap. He'll take care of it. He's the boy—he has to. Forty years and as many million miles hadn't changed a thing. That was family life for you.

Well, we'd see about that. I swung back to the monitor. Tomorrow, she'd said. . . . A lot could happen in one day.

I hesitated over the board. The image of Chloe, face sunk in misery, nagged at me. Maybe I should take a look; but why waste time? Instead I switched to phone and called Horst Beyer, my senior programmer. He was a German who'd emigrated to the US after the native cybernetics industry was banned during the NATO occupation. He knew his stuff—smart as a whip, and not that much of a NeoTeuton either.

He answered on the first ring. "You check that data I flashed you?"

"If you call it 'data,' Alex." Horst looked affronted. "Utter nonsense, in my view."

"Am I right in thinking that they utilize the hospital system?"

"Of course. What they call a 'transcription program' is nothing more than standard copyware. It couldn't process a thing on its own."

"Uh-huh. You free tonight?" He nodded. "All right. Here's what I want. . . ."

My genie woke me at dawn. Dad's condition was deteriorating. Vital signs unstable: breathing shallow, heartbeat unsteady. I rolled upright and sat at the side of the bed, head in my hands. It would be today.

Behind me Monica moved. Her hand touched my shoulder. I clasped it tightly. After a few minutes I got up and got dressed. At the hospital I used the service entrance. I ran into Carl Suggins, the security chief, as I reached the comp room.

Checking the system, was I? Couldn't blame me. Hell of a man, your pop. Don't make 'em like that anymore.

Inside I took out the disc and entered the viroid Horst had written. He'd done all the rewrites on the original software, so there was no compatibility problem. All the same I spent over an hour running checks to make sure.

Then I went to the coffee shop. Eating was out of the question, but I drank two quick cups as I nerved myself to go upstairs. I was heading for the elevator when someone called my name.

It was Randy. He rose from a sofa, feet well apart, as if preparing to challenge me. For the first time I felt sorry for him: caught between two Markhams. What a nightmare that must be.

He tapped his case. A document scrolled out. He handed it to me wordlessly. I opened it, knowing full well what it had to be—Chloe

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wouldn't need Rhea's authorization after all.

The heading caught my eye. "*Maryville?*" That was a county seat to the northwest, snug on the state border. Randy had done some traveling. "You went to Maryville."

He shrugged. "They had the right judge."

"What grounds?"

Randy gestured vaguely. "Possibility of minor antecedent strokes affecting judgment. The most recent will . . . " His voice trailed off.

"I get to appeal, right?"

"Sure, but—" He pointed at the order. "Time is of the essence, Alex."

"Yeah, it would be." I glanced around the lobby. "I don't see Chloe."

"She'll be here."

"She's overjoyed, I suppose."

"Oh, no." He looked me in the eyes for the first time. "To talk to, maybe, but . . . I'm telling you, those bastards have dealt with a thousand Chloes. They know every trick, every last button to push. Got an answer for everything. Doesn't matter, Alex. She knows."

"Damn well ought to," I muttered. "I told her."

"I guess you did," he agreed, and turned away. I went on upstairs.

Dad didn't look any worse. How could he? I raised a hand to the display, only to let it fall. That didn't matter anymore. He was safe. He had his last wish. She'd never get him now, to use as a crutch until her own time came.

But the sense of triumph wasn't there. Only a hollowness, as if, in the end, I'd simply let him down.

Once when we were in school the other kids had turned on Chloe, with that unerring childhood instinct for finding an easy target. They followed her home, teased her, knocked books out of her arms. And me—well, she'd been snotty to me the day before, so I kept to the other side of the street, ignoring the whole thing, running off when her wails got too loud.

Dad was so angry. He didn't hit me. He never had, that I could recall. He did worse: told me that I'd failed him, that he was ashamed of me, that he couldn't believe that I hadn't tried to protect my own sister.

I thought of what Randy had said: how those vultures had manipulated her, had taken advantage of the fact that she was still a child, as she would always be. She'd had to face them by herself, alone in her hardest hour, her weakness completely exposed.

I heard footsteps outside, low voices. I reached for Dad's shoulder. My hand froze inches away.

"Alex?"

She looked terrible: lines on her face I'd never noticed before, dark rings under her eyes that makeup couldn't hide. She stared at me fearfully, holding one glove, pulling at it convulsively with the other. "We're here."

I swallowed the sarcastic remark I'd normally have made and moved away from the bed. She swept forward, bending over to whisper to Dad. I could hear the whine in her voice.

The others waited outside. I felt like slamming the door in their faces. They had no business seeing her this way.

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Chloe straightened up. As if at a signal they came in, the two techs giving me sidelong glances, the counselor blandly planting himself between me and the bed.

I watched as they set up. I might have left any time. The thought never crossed my mind.

Chloe winced as they stuck the leads to Dad's scalp. The counselor murmured something reassuring.

" . . . The hell." The tall guy frowned at his laptop screen.

"What's wrong?" Chloe cried.

The squat one shuffled close. The counselor bent over them, with the air of a priest hearing confession. "Not acquiring the system. Never seen anything like it. . . . "

Chloe raised shaking hands. Her mouth was open as if to scream. For a moment she stood frozen in that pose, then a shudder went through her and she swung slowly toward me. Her eyes caught mine, and I shivered myself as they bored into me. "*Fix it,*" she hissed.

No use denying it; she'd figured it out. When it mattered, she always could. Activating my genie, I hit a few keys. "There we go," the tech said. The counselor gave me an outraged glare. I stared back until he dropped his eyes, and left the room.

I slumped against the opposite wall. Randy was waiting a few steps away, staring at the floor, hands gripping his case as if to crush it. I ignored him. For an unknown time silence reigned.

Then something beeped and a ringing voice said, "I'm happy for you, ma'am."

"Chloe. . . . " A whisper, no more. "Are you there, Mouse?"

"*Daddy!*"

It wasn't his voice at all. It was supposed to grow more lifelike with time, but usually didn't. People just forgot how the real one sounded.

"Come close, Mouse."

The techs emerged. One of them threw a smirk in my direction before drifting off. Randy took a step toward me but then paused, held by the sound coming from inside the room.

It was a low, animal whimper, harsh and rhythmic. I had heard it once before, in the hallway of the old house after Mom's funeral.

I pushed past Randy. The counselor's smile had gone sickly. Chloe was crouched next to the memory box, her quivering back turned toward me.

" . . . It's no good, baby. These things adjust, they adapt to what the owner wants. And what you want would destroy you. I can't leave you in that trap, Mouse. Try to understand."

Chloe's keening drowned out the rest. A few more soft words, something about how Alex and Rhea would help her. She finally went silent, her shoulders shaking from the effort.

"Tell me good-bye, Mouse."

"G-g-g-bye." She rose and turned to me, sobbing openly now.

It took me a few seconds to understand what she was saying. "It's not . . . not . . . "

"No, Mouse," I told her. "It's not him."

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She left the room, arms out as if to steady herself. I moved after her.

"Alex?"

I halted, drowning in the same self-disgust I'd felt all those years ago, after I'd betrayed his little girl. I forced myself to turn back. "Yes, Dad."

"Ah, I don't have to tell you."

"Yeah, you do."

"No—I never did. Just be kind to her, that's all. I should have done better by her, but I never knew how."

Nor do I, I thought.

"Remember one thing: nothing worth doing—"

"Is ever easy," I finished for him.

"Right." There was a long pause. "Good-bye, son. Kiss Rhea for me."

"Godspeed, Dad."

The machine's telltales spasmed and went dead. I stood over it, at that moment understanding what Chloe felt, wanting to ask, do you remember my first day at the office; the time that hitter came looking for me because his car wouldn't obey; watching the stars as the Big Fear roiled and eddied around us?

In the hall Chloe was leaning against Randy. I lifted my hand. He caught my meaning—he nodded as he led her away.

"Uh . . . Mr. Markham," a smooth voice said. "There are occasional problems with the procedure, you understand. But we'd be more than willing to—"

"Get out." I nudged the box with my foot. "Take this with you."

The shadow vanished and we were alone. I went to the bed and took the old and weightless hand. I saw him off, thinking of all that he'd accomplished, all that he'd left undone, all that I'd have to do for him.

The readouts reddened and dimmed. The breathing faded, and grew terrible, and then ceased. After a time the nurses came, and I left to find my sister. ■

History is nothing but a pack of tricks that we play upon the dead.

—Voltaire

You might as well fall flat on your face as lean over too far backward.

—James Thurber

Do not run around in circles merely to appear not to be standing still.

—Pharaonic Egyptian proverb

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Adiamante, L. E. Modesitt, Jr., TOR, $23.95, 316 pp. (ISBN: 0-312- 86021-8).
The Psalms of Herod, Esther Friesner, White Wolf, $5.99, 478 pp. (ISBN: 1-56504-916-0).
Acts of Conscience, William Barton, Warner, $ 12.99, 496 pp. (ISBN: 0-446-67251-3).
Humpty Dumpty: An Oval, Damon Knight, TOR, $22.95, 287 pp. (ISBN: 0-312-86223-7).
Callahan's Legacy, Spider Robinson, TOR, $20.95, 221 pp. (ISBN: 0-312-85776-4).
Cat on the Edge, Shirley Rousseau Murphy, HarperPrism, $5.50, 274 pp. (ISBN: 0-06-105600-6).
How Many People Can the Earth Support? Joel E. Cohen, W. W. Norton, $30, x + 532 pp. (ISBN: 0-393-03862-9).

NOTABLE REISSUES

Ill Met in Lankhmar, Fritz Leiber, White Wolf, $19.99, xii + 339 pp. (ISBN: 1-56504-926-8).
Lean Times in Lankhmar, Fritz Leiber, White Wolf, $21.99, xii + 292 pp. (ISBN: 1-56504-927-6).
Elric: Song of the Black Sword, Michael Moorcock, White Wolf, $19.99, viii + 504 pp. (ISBN: 1-56504-180-1).
Von Bek, Michael Moorcock, White Wolf, $19.99, x + 705 pp. (ISBN: 1-56504-177-1).
Hawkmoon, Michael Moorcock, White Wolf, $19.99, viii + 504 pp. (ISBN: 1-56504-178-X).
A Nomad of the Time Streams, Michael Moorcock, White Wolf, $19.99, viii + 424 pp. (ISBN: 1-56504-179-8).
Eternal Champion, Michael Moorcock, White Wolf, $19.99, xii + 484 pp. (ISBN: 1-56504-176-3).
The Annotated Lost World: The Classic Adventure Novel by Sir Arthur Conan Doyle, Roy Pilot and Alvin Rodin, Wessex Press (P. O. Box 68308, Indianapolis, IN 46268), $34.95, 264 + xxiv pp., indexed (ISBN: 0-938501-23-2).
The Blue Germ, Martin Swayne, Mark Owings (1113 West 40th Street, Baltimore, MD 21211-1749) (on disk), $1 + $1.50 s&h.
Yesterday's Tomorrows, Joseph J. Corn and Brian Horrigan, Johns Hopkins University Press, $24.95, 157 + xviii pp. (ISBN: 0-8018-5399-0).
Over the River & Through the Woods, Clifford D. Simak, Tachyon Publications (1459 18th Street #139, San Francisco, CA 94107, 415-285-5615), 218 pp., introduction by Poul Anderson, limited hardcover $25 (ISBN: 0-9648320-2-X); inquire about deluxe editions signed by Anderson.

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One of the very basic questions of human society is how people can live with each other without war, crime, and environmental despoliation. Utopian fictions were invented to provide us with various proposed answers; so far, all the proposals have suffered from serious defects—naïveté, political unacceptability, excessively wishful thinking, and the like. But the attempts have nevertheless been very interesting, in part for the commentary they provide on the human condition and in part for the pleasure of watching inventive minds at work.

Science fiction has been a major home for utopian fictions. It still is, and one of the latest examples is L. E. Modesitt's **Adiamante**. The plot is simple: Long ago, Earth cast out its logical, computer-oriented, nature-exploiting, politically dominating cyb faction in a nasty war. The planet was held by the demis, who have redesigned their bodies in many ways and are much less driven to impose their will on their surroundings and fellows. Now, millennia later, the cybs are back in a fleet of twelve warships built of the nearly indestructible material adiamante. The reader knows that they are bent on avenging past wrongs. So do the demis. Now what?

The answer seems obvious: The demis whupped 'em once; they should do it again, and the sooner the better. However, in the search for peace, etc., the demis devised a philosophy or ethic that recognizes that actions have prices. To use technology that affects the environment requires that the user perform compensatory labor of some sort, its amount scaled to make sure people think twice or thrice about what they do. They have also engineered themselves so the very thought of violence tends to make them ill. Doing violence can kill them. Only self-defense is tolerable, to some of them, some of the time.

That is, they have to wait for the cybs to strike the first blow, even though they know that first blow could sterilize the planet. In fact, their ethics demand that they should not even try to *prepare* until the cybs have made their threat explicit. One of their most basic principles of human interaction is trust. And they know the odds are against them.

To make such an arrangement work, you have to have all the weaponry and shelters you might need available from the start, mothballed from the ancient past. Preparation can then mean powering up, checking supplies, making repairs, and so on, with a sacrificial "coordinator"—here the protagonist, Ector—chosen to bear the very literal headaches that go with even such a simple lack of trust. And the weaponry has to be enough so that when the moment comes, the demis can utterly destroy their attackers.

That is, never strike first. Strike second, and last. It makes a very interesting, tough-minded utopia and an entertaining story that should appeal to *Analog* readers.

I haven't read every one of the twenty or so books Esther Friesner has written. Most of those I have read

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were distinctly light, humorous, though often had quite a sharp point. In fact, I once called her here, "The new Thorne Smith [with] more bite than he ever managed."

Yet she has a serious side as well. For instance, *Yesterday We Saw Mermaids* (reviewed here in March 1993) struck a blow at intolerance, particularly in its Spanish Inquisition mode.

She wasn't done. **The Psalms of Herod** renews the attack in such exceedingly pungent terms that some of you may not be able to stomach it. And that is a recommendation. This is a fantastic, marvelous, wonderful book, brimming with an ironic, mordant wit and a very feminist sensibility. It's also strong stuff.

Friesner begins by imagining the eco-catastrophe that looms over us today, a time when the soil has lost its fertility to erosion or poisoning, when the climate changes, when the hordes of humanity cannot be fed, when the "hungering times" descend upon us. (I discussed the prospects in this magazine in January 1996; let me note here that the Worldwatch Institute's *Vital Signs 1996* [Norton, $12, 169 pp., ISBN: 0-393-31426-X], which does not include the frightening 1996 crop data, indicates that my projections for the nearest term already look slightly overoptimistic; see also the review of Cohen's book below.) Those who struggle through those times, she says, will be changed. For one thing, there will be a change in women's biology that permits them to engage in intercourse only twice a year, which would be a fairly reasonable anti-overpopulation mutation if it did not still permit almost constant pregnancy.

People being the kinds of critters they are, the change is seen as God's judgment on womankind, who were responsible for the catastrophe by disobeying the divine commandment to obey men in all ways and pop out babies just as fast as they could. They are now less than property, sex objects in spades, taught from childhood to satisfy the perpetually horny men by hand and mouth. People live in "troops" like chimps or monkeys, each one led by an "alph" (the alpha male), and when the troop has too many kids of one gender, new arrivals of that gender are put out on the hillside. When food is short, kids, old women, and even young, fruitful women are winnowed (i.e., killed). And when a troop gains a new alph (by combat and murder), the old alph's kids are killed so the women will become immediately fertile. (Surely Friesner has been reading about basic primate behavior.)

And all this is justified by a Christianity that has rewritten the Bible to put Herod on the right hand of God—the slaughter of the innocents served to ensure plenty for the Son of God.

There's a nasty logic there that forces one to seek other answers to the basic dilemma. Meet Becca, a bright and rebellious girl-child growing up in Wiserways Stead. Through her eyes we see it all, and when her life falls apart in bloody chaos, we go with her in search of that other answer.

She does not find it here. Indeed, the novel closes on a note of delirious optimism, on the brink of a new stage

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where I cannot help but think she will encounter crashing disappointment and perhaps great personal suffering. Yet there have been prophecies in her life. We know she will accomplish great things in the end, and we can hardly wait for the sequel, *The Sword of Mary,* which should be available shortly before you read these words. Look for it. Look for both. You'll be glad you did.

William Barton's stories so often have rather ugly characters doing rather ugly things that one might suspect him of being a curmudgeon. He is actually, of course, an idealist, as his new novel, **Acts of Conscience,** shows quite well. Though it begins close to the mode of the "human supremacy" tale—gloriously high tech and dominance over aliens—those ugly characters and ugly deeds soon lead to a call for "humility in the face of reality." The transition may startle some.

The protagonist of *Acts* is self-centered and unlovable spaceship mechanic Gaetan Du Cheyne, who owns just enough stock in just the right company. When the company shows up with a much faster FTL drive, Gaetan is suddenly rich, possessed of his own FTL ship, and reviving adolescent dreams of wandering the space frontier with hordes of ladies at his feet.

Reality is somewhat different. The ladies don't go down for him, and the local big game slaughtered by the Great White Hunters from Earth looks suspiciously intelligent—in fact, the wolfen of Green Heaven have, over eons, bred a species of meat animal that looks like small furry cowgirls, the dollies. The dollies themselves seem intelligent (smart critters are easier to husband, you know), and they have a pheromonal appeal that makes them the perfect sex objects for humans. The humans on Green Heaven use them in brothels. Gaetan, of course, cannot resist. And what was Barton's warped mind doing with the notion of animal husbandry?

Gaetan is a self-centered twit, but this is enough to upset him even before he acquires his alien sidekick, an arthropodish Kapellmeister who uses neural induction to read minds. The Kapellmeister quickly confirms those suspicions of intelligence. It also reveals that it represents a very ancient species with a jaundiced view of humanity's existence.

Barton's point is Gaetan's growing sense of responsibility to something other than himself, of the need for self-discipline and service to a greater good. *Acts* is the tale of his growing up, if you will, and it thus says there may be hope for humanity.

Damon Knight's latest, **Humpty Dumpty: An Oval,** is billed as the "capstone to his remarkable literary career." I'm not so sure. It's impressive, witty, and possessed of a very sure touch, but its arch surreality probably means that it will appeal much more to fans of Stanislaw Lem than to fans of, say, Robert A. Heinlein.

The tale begins when lingerie dealer Wellington Stout agrees to deliver a parcel to Milan for his brother and gets shot in the head. He wakes up in

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the hospital hearing voices, the bullet still lodged deep in his skull, and his intended contact warning him of the nefarious Dentists and shoe salesmen. There is a strange planet in the sky. Aliens may be amongst us. Craters are popping like pustules all over the world, and there may or may not be alien troops issuing from them. All reality is humptyishly cracked, and things are really falling apart.

Really? It's not just Welly there, hallucinating madly? Well, maybe it is, maybe it isn't. Knight never really says. Perhaps what he means is that it doesn't really matter. Reality is whatever it seems to those who must live it, with or without extra pressures on the brain, and one man's reality is just a good yarn to the rest of us. Except when it's a surrealistic head-scratcher.

Spider Robinson is back with another tale of the Callahan's Bar crew (occupying Mary's Place ever since the Bar got nuked). It's **Callahan's Legacy,** light, frothy, loaded with good humor, puns, and palindromes, and to be treasured mostly for the way it fills in gaps in the background, answering such questions as how Doc Webster, Fast Eddie Costigan, and Long-Drink McGonnigle first came to Callahan's. The frame is vintage Robinson—once more humanity is threatened by aliens from outer space, and somehow this gang of loving inebriates, strengthened by a fellow who is folding a guitar case full of C-notes into paper airplanes one-by-one and flying them into the fireplace, by a gent who can't feel pain, by an Internet sentience named Solace, by the two-weeks-late product of Jake's and Zoey's union, and by several returnees (including Mike and Mary Callahan and Mickey Finn) must save the day—but that won't bother his legion of fans a bit. Those fans have created a whole alternate ficton on the Internet—there's a popular news group, and you can find a list of Callahan's home pages at http://wjh-www.harvard.edu/glazier/callahan.html—and they should be delighted. Even if, Spider says, some of them have never heard of the stories, or of him.

Shed a tear, however, for what Spider promises from the start: a disaster, the ending of Mary's Place.

If you go absolutely ga-ga whazonga boop-boop over puddy tats, you will love Shirley Rousseau Murphy's **Cat on the Edge,** apparently the first in a series featuring cats who have somehow become able to speak English, operate telephones, track down criminals, and perform other deeds a reasonable person might think would require a brain a little larger than a walnut. There are also people who can utter magic words and turn into cats (without worrying about missing mass) which—since they can talk—can say the magic words again and return to normal. It all has something to do with Wales, from whose old coal-stained sod comes a certain murderous car-buyer devoted to chasing down cats with murderous intent.

So there's plot. Even interesting plot, as well as climax and resolution and justice. But the whole thing—including what passes for characteriza-

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tion—is so heavy on the cutes that anyone who is *not* ga-ga whazonga boop-boop over puddy tats is likely to fwow up.

As you know, an issue that worries me is the conflict between human numbers and those resources needed to support human life and civilization. Joel E. Cohen, head of Rockefeller University's Laboratory of Populations, phrases the basic question as **How Many People Can the Earth Support?** His answer is that there is no single numerical answer to the question—estimates of Earth's carrying capacity range from under a billion to over a trillion—for it depends on the answers to such other questions as:

How well do you want to eat?

How well do you want to live?

What level of technology do you wish to use?

How willing are you to share with your neighbors at home and abroad?

How much do you value an intact physical, chemical, and biological environment?

Does your morality permit restraint in reproduction?

Does your political or religious ideology permit educating and empowering women?

The key, he stresses, is human choice, and the choices are ones we must make within the next fifty years. To support this point, Cohen judiciously analyzes a great many population studies and resource estimates. Again and again, he says that there is no one neat, tied-with-a-bow answer. But there are clearly limits, and they as clearly seem to be in the neighborhood of population sizes we may see well before 2100 A.D.

What happens if we fail to make choices? Cohen struggles mightily not to be an alarmist (even when his data seem quite alarming), but to the attentive reader, the answer is clear: If we fail to choose, choice will be forced upon us, and we will probably not like the result. He also notes that putting choices into action takes time—and that the time available may be the single greatest constraining factor.

To see why he says such things, get the book. It's comprehensive, carefully even-handed, and very much worth reading.

NOTABLE REISSUES

Quite frequently I receive new editions of classic SF works. Last month, for instance, there were items by Hartwell, Ellison, Zebrowski, Gunn, and Somtow—the last four from White Wolf Publishing—and I could easily have inaugurated the above "Notable Reissues" heading then. What prompts me to do it now is the arrival of another box from White Wolf, with still more reissues that deserve mention for the sake of all who would dearly love to replace ancient, crumbling paperbacks of beloved stories with something new and solid. (For the latest word, you can visit White Wolf at http://www.white-wolf.com.)

First, here are two by Fritz Leiber, one of the crucial, much-imitated founding fathers of modern fantasy, here relating the adventures of those prototypical swashbucklers of me-

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dievaloid magic, Fafhrd and the Grey Mouser. **Ill Met in Lankhmar** contains the two older books, *Swords Against Deviltry* and *Swords Against Death*. **Lean Times in Lankhmar** includes *Swords in the Mist* and *Swords Against Wizardry*.

Second, here are five series omnibuses (of a planned fifteen edited by John Davey) by Michael Moorcock, the extraordinarily prolific and also much-imitated exponent of quite a different sort of fantasy. **Elric: Song of the Black Sword** contains *Elric of Melnibone, The Fortress of the Pearl* (reviewed here in March 1990), *The Sailor on the Seas of Fate, The Dreaming City, While the Gods Laugh,* and *The Singing Citadel*. **Von Bek** includes *The War Hound* and the *World's Pain* (reviewed here in June 1982), *The City in the Autumn Stars* (reviewed here in March 1990), *The Dragon in the Sword,* and *The Pleasure Garden of Felipe Sagittarius*. **Hawkmoon** contains *The Jewel in the Skull, The Mad God's Amulet, The Sword of the Dawn,* and *The Runestaff*. **A Nomad of the Time Streams** includes *The Warlord of the Air, The Land Leviathan,* and *The Steel Tsar*. **Eternal Champion** contains *The Eternal Champion, The Sundered Worlds, Phoenix in Obsidian,* and the short *To Rescue Tanelorn*. . . . Note that at current paperback prices, it is actually more economical to buy some of these Moorcock hardbounds than it would be to buy new paperbacks of the individual novels—if you could find them.

Not from White Wolf but from Wessex Press, and in the wake of *Jurassic Park* and other recent dinomanias, comes Roy Pilot's and Alvin Rodin's **The Annotated Lost World: The Classic Adventure Novel by Sir Arthur Conan Doyle**. Numerous illustrations are drawn from the novel's early appearances (it first appeared in 1912) and other period sources. An introduction outlines the tale's genesis and seminal effect on later writers. Numerous notes explicate the obscure. Appendices discuss the 1925 silent film version and other matters. All in all a nice addition to the scholarly library.

Of similar vintage is Martin Swayne's 1918 book, **The Blue Germ**, just reissued on MS-DOS disk by Mark Owings for such an astonishingly low price he has to be in it for love. Swayne was the pseudonym of Maurice Nicoll (1884-1953), a versatile British writer of humor, war memoirs, and books in the area of psychology, philosophy, and religion. This novel deals with a deliberately produced plague of immortality and is thus of some interest to readers of modern SF, which deals necessarily and frequently with genetic engineering. It is of course a novel of its time, further marred by more typos than I have noticed in previous Owings materials, but it remains interesting.

Another sort of Lost World is represented by Joseph J. Corn's and Brian Horrigan's fascinating and very nicely illustrated **Yesterday's Tomorrows,** first published in 1984 to accompany a Smithsonian Traveling Exhibition. This is the world imagined by our forebears, as seen on SF magazine covers and in popular science maga-

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zines, in the dreams of industrial designers and Hollywood futurists. It is arcologies, Dymaxion homes, atom-powered cars, and space travel. And if some of it still looks pretty good, most of it still isn't here.

Jacob Weisman writes that he wishes to "revitalize the reputation of one of the old masters" with **Over the River & Through the Woods**, a collection of the late Clifford D. Simak's "stories that have best survived the test of time." The stories cover almost 30 years of Simak's career, from "Good Night, Mr. James" (1951) to "The Grotto of the Dancing Deer" (*Analog*, 1980).

Weisman's aim is laudable, for Simak is one of my own favorites; many of his novels remain as readable and thought-provoking today as anything being written now, and if they seem less than original to those who come to them fresh, that is chiefly because their ideas and approaches have been endlessly borrowed and imitated. Simak was one of the greats who made SF what it is; he deserves a great deal more credit than he is usually given, and certainly more than is given to others who were more assiduous about blowing their own horns. ■

(Biolog continued from page 40)
Best 1995 Short Story and nomination for a Hugo at the 1996 Worldcon. At the 1996 World SF Convention, Michael was also up for the John W. Campbell Award for Best New Writer.

An article by Michael was subsequently commissioned by *The Writer* magazine: *Writing Successful Science Fiction*. Like Hal Clement before him, Michael now teaches physics and math at a private academy in the Boston area. This gives him the time to write that a single-minded dedication to research would not. Especially welcome is the local writer's workshop Critical Mass that he finds helpful and stimulating.

Considering the knowledge one must first acquire and the skills one must develop, it would be fair to characterize Michael A. Burstein as an overnight success at age 26. Where once the writers for *Analog* were a rare phenomenon, the present-day science fiction world naturally creates persons attuned to the future. A very old *Analog* is heading towards the 21st century with a crew of often very young writers. The future is apt to be very exciting. ■

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Dear *Analog,*

I understand that hard science fiction is no longer in fashion, but even so I was appalled by the many scientific errors in Robert J. Sawyer's *Starplex* (July 1996).

Perhaps the most egregious is the reference to the discovery of a new generation of quarks, referred to as glossy and matte. So far, so good. However, when it turns out that the quarks of "luster matter" have zero electric charge and are not subject to the Electromagnetic Interaction, the urge to throw the magazine at the wall looms large. When I find that they *are* subject to the Weak Interaction, the urge becomes irresistible.

If the author wishes to postulate that the Electroweak unification was incorrect, then he should have given that as part of the background. Since he didn't, any particle subject to the Weak Interaction should be subject to the Electromagnetic Interaction.

The Weak Interaction is mediated by the exchange of charged vector bosons (except for weak neutral currents). How the uncharged "luster" quarks are supposed to exchange W+ and W- bosons with other quarks is a question best not asked.

This is but one problem of many, and they are not limited to the physics. IMHO a scientific editor is overdue.

SHMUEL (SEYMOUR J.) METZ
SysProg & JOAT, Atid/2, Team OS/2, Team PL/I

Hard science fiction is still very much "in fashion" at Analog, *and we already have a scientific editor (Ph.D. in physics, experience in several other fields), although admittedly not an infallible one. In the only one of "many" cases you specifically cite, at least, the mistake is yours. The author did give the background you say he should have, at least twice. The alternate model he postulated to replace our "standard" model was worked out with another physicist, and the story was checked and approved by still another.*

Perhaps your O should be a bit more H—and certainly you should read more carefully before criticizing so harshly.

Stan:

I have a minor quibble with Poul Anderson, regarding his guest editorial in the July double issue.

First, I'd like to declare my respect and affection for one of the foremost authors of my time. His accomplishments are legion, and his words have sung to all of us.

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However: I fear that his age is showing, just a bit, when he refers to Ursula Le Guin as the exemplar of "today's" handling of human, adult themes. . . . She writes magnificently, granted, but has been doing so for quite a few years. Longer, I suspect, than some of today's readers have been alive.

Similarly, in another recent issue I noticed with wry amusement the article citing the transistor as an example of the great things Bell Labs produces whilst doing its "pure science." Sheesh! That was nearly a half century ago! Haven't they done anything since?

Poul also remarks that Asimov, in his later years, ". . . agreed that human affairs are chaotic and we never will have a Hari Seldon." I am not so sure. Perhaps not an exact equivalent, but surely the scientific representation of human behavior individually and en masse will advance. Even now, as I recall, the latest Nobelist in economics won the prize by, in effect, proposing that people will act in what they perceive to be their best interests. A small step for the social sciences, but . . . in a forward direction.

We wait, we see. . . .

WARREN RAYLE

Olmsted Twp., OH

Since Ursula Le Guin is still actively writing, I don't see that the fact that she's already been doing it for some years makes her any less good an example of Poul's point. And of course Bell Labs did lots of things since the transistor—but that remains one of the best examples of something with really fundamental, revolutionary consequences that have affected everybody's life.

Dear Dr. Schmidt,

As a nuclear engineer, it was with extreme interest that I read John G. Cramer's Alternate View column of July 1996 ("Burn Up the Nuclear Waste"). I would like to point out one thing he didn't mention.

On page 169 he says, ". . . During the Carter Administration (1977-1981) the chemical reprocessing of spent nuclear fuel was considered a technology that encouraged nuclear weapons proliferation (by extracting from spent fuel rods plutonium that might be used to make bombs). President Carter therefore ordered the U.S. program for chemical reprocessing of nuclear fuels terminated 'to set an example for the rest of the world.'" This is accurate in that Carter did cancel the program for those reasons. What Dr. Cramer doesn't state is that the reprocessing of weapons-grade plutonium from spent commercial nuclear fuel rods is nearly impossible.

The plutonium isotope used in weapons is plutonium-239. Most other plutonium isotopes are nonexplosive. Under neutron bombardment in a reactor, U^{238} is transmuted into U^{239}. By successive beta decays, this transmutes itself in a few days into Pu^{239}. If the reactor were shut down at this point, the only plutonium isotope present would be Pu^{239}. But commercial reactors aren't shut down; they can remain at full power for over a year. This is plenty of time for the Pu^{239} to be transmuted into higher *nonexplosive* isotopes of plutonium by the unceasing neutron

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bombardment. *Plutonium reprocessing from commercial reactors requires isotope separation as well as chemical separation*—which is much more difficult. This is why plutonium proliferation from commercial reactor waste is the least of our worries. In my opinion, this makes Dr. Cramer's proposal for treating unnecessary, and wasteful of the energy we could extract from the plutonium.

What I still cannot fathom is how Carter could have made that decision. It is scientific nonsense, and the man never ceased to tell us he was a nuclear engineer!

MICHAEL NOLLET

Wilmington, DE

The author replies. . . .

Dear Stan,

Michael Nollet's comment on my recent Alternate View column "Burn Up the Nuclear Waste" is almost correct. He notes that the reprocessing of spent fuel from commercial power reactors is not a source of weapons-grade plutonium, and goes on to assert that "Cramer's scheme for treating nuclear waste (is) unnecessary and wasteful of the energy we could extract from the plutonium."

First, let me say that the accelerator-based scheme for "burning" the long-lived actinides in nuclear waste is not my scheme. I was just reporting on a new idea that is being studied and promoted by groups at the national laboratories of several countries. Second, the energy content of the plutonium and other actinides is not "wasted," since it is released in the burn up process and can be used for power generation, perhaps with more efficiency than would be possible in a reactor, since the source temperatures are probably higher.

Mr. Nollet is correct in stating that the plutonium-239 recovered from the spent fuel from the normal operation of commercial power reactors will be contaminated with other plutonium isotopes and therefore not "weapons-grade." This is because the neutrons from spontaneous fission of the other isotopes make it more difficult to produce a nuclear explosion and more likely to have a "fizzle" instead.

However, any country which possessed a chemical reprocessing facility and wanted to produce nuclear weapons would only need to operate its power reactors at high power for a few weeks and then pull out the fuel slugs for reprocessing to generate weapons-grade plutonium. This, I think, is what the Carter Administration was worried about. I do not agree with their decision, and it is clear in retrospect that their "good example" had no effect, but there is a connection between reprocessing and weapons production.

JOHN G. CRAMER

Dear Dr. Schmidt:

I know you go to considerable lengths to check the science in *Analog* stories and articles, but maybe a few more resources could be devoted to checking other facts. The story which prompts this observation is "The Alicia Revolution" by Doug Larsen, which appeared in the July 1996 issue. The penultimate scene features a US ambassador forcibly evict-

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ing a US citizen from the fictional country of Thusbammanna. Any U.S. diplomat who took such an action would be in violation of US law and undoubtedly in a great deal of trouble.

The US government and its officials cannot interfere with foreign travel by US citizens except to a very small number of states where travel has been constrained by an act of Congress. US diplomats have no authority to order, much less forcibly remove, a US citizen from a foreign country, except in cases where a legal extradition order has been issued by a US court. An ambassador who behaved along the lines described in Mr. Larsen's story, assuming he or she could convince the Marine Security Guards to obey an illegal order, would be swiftly recalled to Washington and probably booted out of the foreign service. I suspect that both the ex-ambassador and the US government would be open to an expensive civil suit from the aggrieved US citizen. In other words, this would not be a smart career move!

Setting aside the improbability of this scene, I am not sure I understand what it adds, either logically or stylistically, to Mr. Larsen's story. Perhaps he is trying to make a case against US government indifference to human rights violations abroad. There have undoubtedly been cases in the past where US embassies have tolerated human rights abuses in deference to other US interests. For several years, however, every US embassy has had a statutory obligation to produce an annual report on the human rights situation in its host country. The guidelines for preparation of these reports are quite detailed and require the embassy to cover a wide range of potential issues in considerable depth. The reports are compiled in a book which is submitted to Congress and distributed widely to organizations and members of the public interested in human rights. This makes it very difficult for a US embassy to ignore a bad human rights situation in its host country, even if embassy staff were so inclined.

COLIN HELMER

Bethesda, MD

P.S. To reveal my own biases in this matter, I have been in the US foreign service for 17 years. I don't believe I fit the stereotype of the uncaring, narrowly focused bureaucrat portrayed in Mr. Larsen's story and I don't believe my colleagues do either.

The author replies. . . .

"Uncaring, narrowly focused bureaucrat"??? Good heavens, I certainly don't have that opinion of our diplomats!

The American embassy in Thusbammanna was written to be a reassuring, safe place protected from the chaos of the rest of the country. The ambassador was written to be a tough, strong, decisive person who was successfully doing her job of protecting American citizens and American interests. The marines were written to be friendly, strong and capable.

The fact that ambassadors don't have the authority to remove American citizens from a foreign country when it is in the best interests of the citizen, and in the best interests of the United States, is incredible to me. Well—not incredible, because I believe you, but I think it's outrageous.

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In the case of Jane Anderson, the lack of this authority could have cost her her life. In addition, it could have destroyed high-level maneuverings to remove a despot and replace him with a democratically elected, pro-American leader. If the dictator had stayed in power, many thousands of people would have suffered as a result.

I'm not sure where you got the idea that I was criticizing the human rights activities of American embassies, but I intended nothing along those lines.

DOUG LARSEN

Dear *Analog*,

I have enjoyed your magazine for some years now. I dropped *Fantasy & Science Fiction* because it became too much fantasy. Anyway, I have to ask why you printed the story "The Alicia Revolution" in the July 1996 issue. I couldn't figure out anything about it that was science fiction unless you stretch to include the computer-controlled traffic. Just curious.

Otherwise, your story selection is, I think, very good. Fortunately, your various four-part series have been so good that I anxiously awaited each installment. Keep up the good work, I enjoy your magazine a lot.

DENNIS D. GAUNT
The University of Iowa
Oakdale Research Campus
Iowa City, IA 52242

It's true that the subject matter of "The Alicia Revolution" is rapidly approaching mainstream; but for now, at least, it seems to me very much science fiction in the sense of a story that explores the impact new technology might have on a way of life, and from which that speculative element can't be removed without making the whole story collapse.

Dear Dr. Schmidt,

I read the two pieces by Tom Ligon (July 1996) with mounting interest. Like many (most? all?) *Analog* readers, I feel sure there has to be a way other than NASA's way into space. Why not amateurs?

In that connection, money is clearly needed. Private money. And we have some precedents and suggestions . . . some fictional and some factual.

Fiction: In the Pal/Heinlein movie *Destination Moon* (1950), Jim Barnes put together a consortium of likeminded business men to finance his highly experimental atomic drive spaceship.

Fact: In 1929, Fritz Lang not only hired Transylvanian space scientist Hermann Oberth as his scientific advisor on Lang's movie *Frau in Mond* but "pledged a rather large sum of money" for Oberth to build a liquid-fuel rocket to be launched on the day the film premiered. (Willy Ley, *Rockets and Space Travel*; Viking Press, 1947.)

Fact: A few years later, Dr. Robert Goddard's rocket researches were funded by grants from Daniel Guggenheim and the Carnegie Institution. (Ley, op. cit.)

So why not tap Hollywood for the money? Steven Spielberg has already donated tens of thousands to the Planetary Society's SETI program. Would he, George Lucas and, perhaps Ted Turner be willing to put a couple million into Aerodesic in exchange for, say, exclusive rights to the "inside" story plus

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merchandising tie-ins, etc? Precedent: *Life* magazine bought exclusive rights to the lives of the Mercury astronauts for the duration of that program.

Question? Who out there in *Analog*-land knows how to get in touch with Lucas and the others? And might be willing to spearhead the push the way Bjo Trimble orchestrated the saving of *Star Trek* decades ago? Can the suggestion be put up on the Web?

GEORGE W. EARLEY
8820 Dog River Road
Mount Hood, OR 97041

Some folks are already working on it—please see the following!

Dear Stan,

Thanks for sending me a copy of Mr. Earley's letter (and thank you, Mr. Earley, for writing in the first place).

He is absolutely right: the way to get private individuals (you and me) into space now is with private money! Government money is too expensive (example: Spacelab, the government-owned and -built science lab that flies in the Space Shuttle, cost about 100 times what Spacehab, the only commercial spacecraft flying, did . . . and they perform nearly identical functions).

As Tom Ligon noted in "Prospectus" (July 1996), amateurs and small enterprise are the way to go. As big business grows, it quickly takes on the least desirable features of government (bureaucracy, inertia, and lack of individual accountability). Big business is afraid of the unknown, far better to take a small, sure profit than to gamble for a big, unsure profit.

Well, there are a few groups of people who know that smaller is better, are willing to take some risks, and intend to get people into space to stay. One is Dr. Hill's Aerodesic Research. Another was profiled in the January 1995 issue of *Analog*: the Artemis Project.

Since that introductory article, the Project has matured and solidified. We're still maintaining that "small company" mentality, but in order to succeed, we know we have to grow. Unlike Dr. Hill, the Artemis Project is not interested in building a rocket—there are a number of organizations that already have (or will have) the launch capability we will need when we need it. Instead, we're concentrating on building a permanent, manned, commercial Moon base.

Mr. Earley is right on target—Hollywood, and more generally, the entertainment industry, is the place to find the needed money. An example we've been using: NASA's Fiscal Year 1995 budget was $14.1 billion (of which $1.85 billion was budgeted for the space station program). In 1994, the new entertainment conglomerate Disney/ABC grossed $ 16.5 billion, and showed a net profit of $1.8 billion. Admittedly, this is perhaps the largest entertainment company. Nevertheless, those numbers look awfully similar. And a commercial space program would require a smaller budget.

We're not quite ready to approach the movie moguls Mr. Earley lists because we view any such meeting as a one-shot deal—we don't want to blow our chance. Instead, we are setting up the foundations of an entertainment empire, and affiliating with smaller companies. Final Frontier

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Jerky may be eaten on an upcoming shuttle flight. Duncan Graphics Systems is designing the Luna City Hotel line of merchandise. Lunar Traders, a subsidiary of The Lunar Resources Company, has already opened for business. And *Artemis Magazine*, a new magazine of science and science fiction, will be appearing soon. No one of these companies or divisions is going to bring in the kind of money necessary to get people into space, but all of them, working in concert with many others in the planning and negotiating stages, will do it soon.

The Artemis Project, which starts and ends in Low Earth Orbit, is budgeted for $1.42 billion from a standing start, through planting the first base on the Moon, and returning the first crew to Earth. Can we do it? Take a look at that Disney/ABC profit for one year . . . we intend the first flight within a decade.

And, though we're not building a rocket, we are enthusiastically cheering on groups like Dr. Hill's Aerodesic Research. Nearly two-thirds of that $1.42 billion budget is for launch and recovery—we've based our numbers on using two launches of the space shuttle at $400 million each. If Dr. Hill can cut the cost to orbit by a factor of ten, we'll be at the head of his customer line!

We're all looking for volunteers. As Tom Ligon noted, Dr. Hill is looking for Loyal Techs. The Artemis Society International is looking for volunteers, and The Lunar Resources Company would love to license the Project to other companies interested in making (and taking) a piece of the commercial space flight pie—there's enough for everyone! All it takes is hard work, dedication, and the will to get ourselves there.

We're going back to the Moon! We're doing it as a commercial project! You can come, too!

IAN RANDAL STROCK
Editor, *Artemis Magazine*

Artemis Project contact addresses:

Artemis Society International, PO Box 4878, Huntsville, AL 35815; artemis@asi.org; http://www.asi.org

The Lunar Resources Company, PO Box 590213, Houston, TX 77259-0213; http://www.tlrc.com

Artemis Magazine, 1380 East 17 Street, Suite 201, Brooklyn, NY 11230; irs@tlrc.com; http://www.tlrc.com/artemag/artemis-mag.html

Dear *Analog*,

Please let Alexis Latner know that there is not now and never has been zoning in Houston, contrary to her assertion on page 174 of "Threat of Stars at 912 Main." Houston seems to be the only large city that has never practiced that vice. (Yes, I know that she only mentions the threat of zoning, but it still gives the impression that the city does have some zoning restriction.)

I really enjoyed the story. I don't remember the Lamar building specifically, but do remember several of the old-style buildings from my thankfully few months of working downtown.

PAT MCGEE
jpm@roadrunner.com
PO Box 670
Chimayo, NM 87522

Remember, the story takes place in the future, so it could very well *have zoning (or at least the threat of it) by story time!* ■

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UPCOMING EVENTS Anthony Lewis

24–26 January
CONFUSION 17 (Michigan SF conference) at Van Dyke Park Suite Hotel and Conference Center, Warren, MI. Guest of Honor—Samuel R. Delany; Artist Guest of Honor—Susan Van Camp; Fan Guest of Honor—Joey Shoji; Science Guest of Honor—Mark Shapiro. Registration: $25 until 31 December 1996; $30 at the door. Info: AASFA/ConFusion, Box 8284, Ann Arbor, MI 48107. Phone: (303) 487-8743.

14–16 February
BOSKONE 34 (New England regional SF conference) at Sheraton Tara, Framingham, MA. Guest of Honor—John M. Ford; Official Artist—Ron Walotsky; Featured Filk Performer—Tom Smith. FanHistoricon, a mini-con dedicated to preserving and recording fannish history, will be hosted. Registration: $34 until 19 January 1997, more at the con. Info: Boskone XXXIV, Box 809, Framingham, MA 01701-0203. Phone: (617) 625-2311, Fax: (617) 776-3243. URL: http://www.panix.com/NESFA/home.html

15–17 March
CONAMAZOO FOUR (Michigan area SF conference) at Stouffer Battle Creek Hotel, Battle Creek, MI. Guest of Honor—Pamela Dean; Filk Guest—Steve MacDonald. Registration: $20 until 14 February, $25 thereafter. Info: Conamazoo Four, Box 1546, Evanston, IL 60201-1546. Phone: (708) 328-8765. E-mail: conamazoo@tezcat.com URL: http://www.tezcat.com/~erik/zoo.shtml

28 August—1 September
LONESTARCON 2 (55th World Science Fiction Convention) at San Antonio Convention Center, San Antonio, Texas. Guests of Honor—Algis Budrys and Michael Moorcock; Artist Guest of Honor—Don Maitz; Fan Guest of Honor—Roy Tackett; TM—Neal Barrett, Jr. Registration until 7 July 1997: $95;supporting $25;children 3-12 $40; children 0-3 FREE (age as of 28 August 1997). This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition—the works. Info: LoneStarCon 2, Box 27277, Austin, TX 78755-2277. Voicemail: (512) 435-7446, Fax: (512) 435-7747, E-mail: lsc2@io.com

Convention runners: If your convention has a telephone, fax, E-mail, or Web page URL, please let us know so that we can publish this information.

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TECHNOLOGY UPDATE

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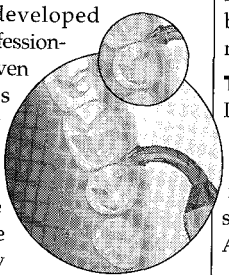
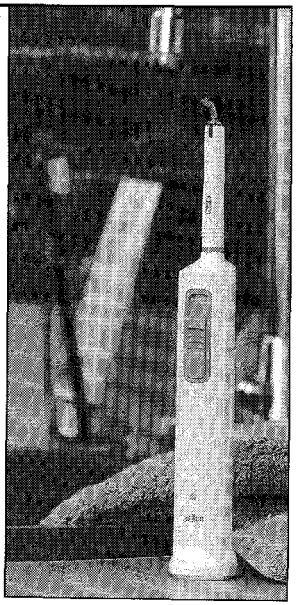


To ensure correct entry into the interdental space, hold the Interclean horizontally, just like a toothbrush, and at a 90-degree angle to the teeth. Position the tip at the interdental space and turn the unit on. Let Interclean do all the work! Hold still for three seconds, then turn the unit off and move to the next interdental space. Repeat this process until each interdental space has been cleaned.

When you're done dispose of the tip and set the Interclean back on its recharging base for the next use.



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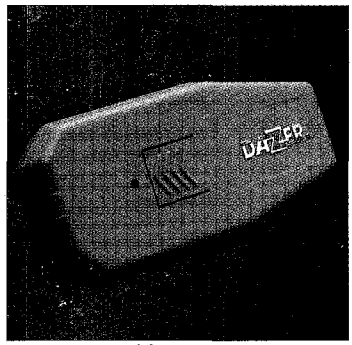

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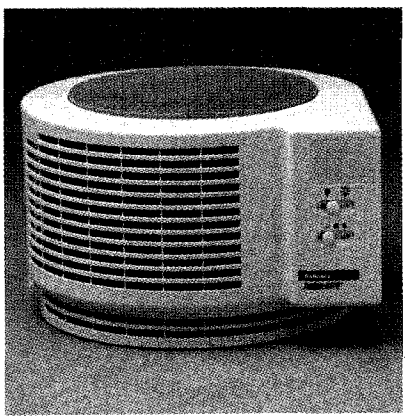

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